

09/11/2004

10784312

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fields  
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status data from INPADOC  
NEWS 9 SEP 01 INPADOC: New family current-awareness alert (SDI) available  
NEWS 10 SEP 01 New pricing for the Save Answers for SciFinder Wizard within  
STN Express with Discover!  
NEWS 11 SEP 01 New display format, HITSTR, available in WPIDS/WPINDEX/WPIX  
NEWS 12 SEP 27 STANDARDS will no longer be available on STN  
NEWS 13 SEP 27 SWETSCAN will no longer be available on STN  
NEWS 14 OCT 28 KOREAPAT now available on STN

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MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP),  
AND CURRENT DISCOVER FILE IS DATED 11 AUGUST 2004  
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=> FIL STNGUIDE

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COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

0.21

0.21

FILE 'STNGUIDE' ENTERED AT 09:20:56 ON 09 NOV 2004

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AND TECHNOLOGY CORPORATION, AND FACHINFORMATIONSZENTRUM KARLSRUHE

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=> file reg

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

0.06

0.27

FILE 'REGISTRY' ENTERED AT 09:21:08 ON 09 NOV 2004

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STRUCTURE FILE UPDATES: 7 NOV 2004 HIGHEST RN 776240-21-2

DICTIONARY FILE UPDATES: 7 NOV 2004 HIGHEST RN 776240-21-2

TSCA INFORMATION NOW CURRENT THROUGH MAY 21, 2004

Please note that search-term pricing does apply when conducting SmartSELECT searches.

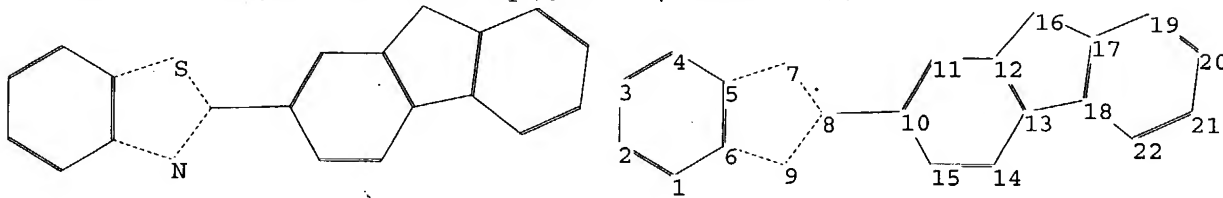
Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. For more information enter HELP PROP at an arrow prompt in the file or refer to the file summary sheet on the web at:

<http://www.cas.org/ONLINE/DBSS/registryss.html>

=>

Uploading C:\Program Files\Stnexp\Queries\10784312.str



ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

chain bonds :

8-10

ring bonds :

1-2 1-6 2-3 3-4 4-5 5-6 5-7 6-9 7-8 8-9 10-11 10-15 11-12 12-16 12-13  
13-18 13-14 14-15 16-17 17-18 17-19 18-22 19-20 20-21 21-22

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exact/norm bonds :

5-7 6-9 7-8 8-9 12-16 13-18 16-17

exact bonds :

8-10

normalized bonds :

1-2 1-6 2-3 3-4 4-5 5-6 10-11 10-15 11-12 12-13 13-14 14-15 17-18  
17-19 18-22 19-20 20-21 21-22

Match level :

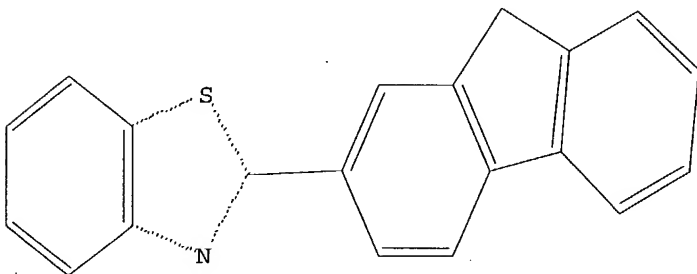
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom  
11:Atom 12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:Atom 18:Atom 19:Atom  
20:Atom 21:Atom 22:Atom

L1 STRUCTURE UPLOADED

=> d

L1 HAS NO ANSWERS

L1 STR



Structure attributes must be viewed using STN Express query preparation.

=> s l1 full

FULL SEARCH INITIATED 09:21:44 FILE 'REGISTRY'

FULL SCREEN SEARCH COMPLETED - 1197 TO ITERATE

100.0% PROCESSED 1197 ITERATIONS

54 ANSWERS

SEARCH TIME: 00.00.01

L2 54 SEA SSS FUL L1

=> file caplus

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

155.42

155.69

FILE 'CAPLUS' ENTERED AT 09:21:50 ON 09 NOV 2004

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FILE COVERS 1907 - 9 Nov 2004 VOL 141 ISS 20  
FILE LAST UPDATED: 8 Nov 2004 (20041108/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s l2

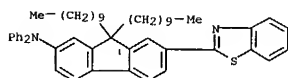
L3 49 L2

=> d ibib abs hitstr tot

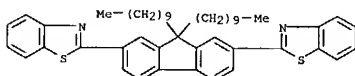
09/11/2004

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L3 ANSWER 1 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN  
 ACCESSION NUMBER: 2004:670129 CAPLUS  
 DOCUMENT NUMBER: 141:303847  
 TITLE: Two-photons and beyond: 2, 3 and 4 photon absorption in conjugated fluorenes  
 AUTHOR(S): Belfield, Kevin D.; Hernandez, Florencio E.; Cohanoschi, Ion; Bondar, Mykhailo V.; Van Stryland, Eric W.  
 CORPORATE SOURCE: Department of Chemistry and School of Optics: CREOL and FPCE, University of Central Florida, Orlando, FL, 32816-2366, USA  
 SOURCE: Polymeric Materials: Science and Engineering (2004), 91, 346-347  
 CODEN: PMSEEG; ISSN: 0743-0515  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal; (computer optical disk)  
 LANGUAGE: English  
 AB UV/Vis and fluorescence spectroscopic techniques were applied to study photophys. behavior of 3 conjugated fluorenes in hexane: 2-(2-benzothiazolyl)-7-diphenylamino-9,9-didecylfluorene, 2,7-bis(diphenylamino)-9,9-didecylfluorene, and 2,7-bis(2-benzothiazolyl)-9,9-didecylfluorene.  
 IT 262607-32-9 745079-42-9  
 RL: PRP (Properties)  
 (multi-photon absorption in conjugated fluorenes)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



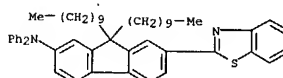
RN 745079-42-9 CAPLUS  
 CN Benzothiazole, 2,2'-(9,9-didecyl-9H-fluorene-2,7-diyl)bis- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

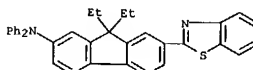
L3 ANSWER 2 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN (Continued)

L3 ANSWER 2 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN  
 ACCESSION NUMBER: 2004:620612 CAPLUS  
 DOCUMENT NUMBER: 141:285327  
 TITLE: Resonant enhancement of two-photon absorption in substituted fluorene molecules  
 AUTHOR(S): Hales, Joel M.; Hagan, David J.; Van Stryland, Eric W.; Schafer, K. J.; Morales, A. R.; Belfield, K. D.; Facher, P.; Kwon, O.; Zojer, E.; Bredas, J. L.  
 CORPORATE SOURCE: School of Optics/CREOL, University of Central Florida, Orlando, FL, 32816-2700, USA  
 SOURCE: Journal of Chemical Physics (2004), 121(7), 3152-3160  
 CODEN: JCPSA6; ISSN: 0021-9606  
 PUBLISHER: American Institute of Physics  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The degenerate and nondegenerate two-photon absorption (2PA) spectra for a sym. and an asym. fluorene derivative were exptl. measured in order to determine the effect of intermediate state resonance enhancement (ISRE) on the 2PA cross section  $\delta$ . The ability to tune the individual photon energies in the nondegenerate 2PA (ND-2PA) process afforded a quant. study of the ISRE without modifying the chemical structure of the investigated chromophores. Both mols. exhibited resonant enhancement of the nonlinearity with the asym. compound showing as much as a twentyfold increase in  $\delta$ . Furthermore, the possibility of achieving over a one order of magnitude enhancement of the nonlinearity reveals the potential benefits of utilizing ND-2PA for certain applications. To model ISRE, we have used correlated quantum-chemical methods together with the perturbative sum-over-states (SOS) expression. We find strong qual. and quant. correlation between the exptl. and theor. results. Finally, using a simplified three-level model for the SOS expression, we provide intuitive insight into the process of ISRE for ND-2PA.  
 IT 262607-32-9  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)  
 (resonant enhancement of two-photon absorption in substituted fluorene mols.)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 63 THERE ARE 63 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 3 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN  
 ACCESSION NUMBER: 2004:577508 CAPLUS  
 DOCUMENT NUMBER: 141:267426  
 TITLE: Few-states models for three-photon absorption  
 AUTHOR(S): Cronstrand, Peter; Norman, Patrick; Luo, Yi; Agren, Hans  
 CORPORATE SOURCE: Theoretical Chemistry, SCFA9, Royal Institute of Technology, Stockholm, SE-106 91, Swed.  
 SOURCE: Journal of Chemical Physics (2004), 121(5), 2020-2029  
 CODEN: JCPSA6; ISSN: 0021-9606  
 PUBLISHER: American Institute of Physics  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Few-states models are derived for the calcn. of three-photon absorption matrix elements. Together with earlier derived few-states models for two-photon absorption, the models are evaluated against results from response theory calcns. that provide the full sum-over-states values. It is demonstrated that not even for systems with charge-transfer character, where few-states models for two-photon absorption are in excellent agreement with response theory, do the models provide a quant. correct description for three-photon absorption. The convergence behavior, merits, and shortcomings of the models are elucidated in some detail.  
 The role of various characteristics of the electronic structure, such as symmetry, charge transfer, and conjugation-important for the formation of a large three-photon cross section-is analyzed. As for two-photon absorption cross sections, it is essential to consider generalized few-states models also for three-photon absorption, i.e., to account for dipolar directions and laser beam polarization. Despite their poor quant. performance, it is argued that few-states models at times can be useful for interpretation purposes when applied to three-photon absorption.  
 IT 222617-85-8  
 RL: PRP (Properties)  
 (few-states models for three-photon absorption in)  
 RN 222617-85-8 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

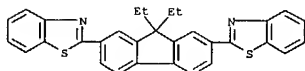


REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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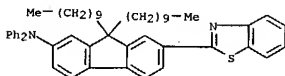
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L3 ANSWER 4 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2004:543643 CAPLUS  
 DOCUMENT NUMBER: 141:313812  
 TITLE: Synthesis, Characterization, and Optical Properties of  
 of  
 AUTHOR(S): New Two-Photon-Absorbing Fluorene Derivatives  
 Belfield, Kevin D.; Morales, Alma R.; Kang, Bong-Soo;  
 Hales, Joel M.; Hagan, David J.; Van Stryland, Eric  
 W.; Chapela, Victor M.; Percino, Judith  
 CORPORATE SOURCE: Department of Chemistry and College of Optics and  
 Photonics: CREOL FPCE, University of Central Florida,  
 Orlando, FL, 32816, USA  
 SOURCE: Chemistry of Materials (2004), 16(23), 4634-4641  
 CODEN: CMATEX; ISSN: 0897-4756  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The synthesis of a series of four new compds. containing fluorenyl  
 chromophores is presented, along with the results of spectroscopic and  
 photochem. studies aimed at understanding the two-photon absorption  
 properties and energetics of their electronically excited states. The  
 mol. structures of the compds. were systematically varied to allow  
 comparison of mol. possessing high and low mol. symmetry, short and long  
 alkyl chains, and a fluorenyl conjugated  $\pi$ -system. Solvent-dependent  
 absorption and emission were investigated along with  $\pi$ -conjugation  
 length. Preliminary measurements of two-photon absorption (2PA) using a  
 two-photon fluorescence method indicate that these chromophores exhibit  
 high two-photon absorptivity. A sym. mol. (3), possessing a relatively  
 large  $\pi$ -conjugated system, flanked on either side by  
 electron-withdrawing groups (benzothiazole), exhibited a peak 2PA cross  
 section (8) of 6000 + 10-50 cm<sup>2</sup> s photon<sup>-1</sup> mol<sup>-1</sup> at 600 nm.  
 Excitation anisotropy studies revealed the position of the S<sub>0</sub> + S<sub>1</sub>  
 and S<sub>0</sub> + S<sub>2</sub> electronic transitions. Consistent with quantum mech.  
 selection rules, the two-photon allowed transition (S<sub>0</sub> + S<sub>2</sub>) was  
 dominant.  
 IT 745079-41-8P 745079-42-9P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (synthesis, characterization, and optical spectra of  
 two-photon-absorbing fluorene derivs.)  
 RN 745079-41-8 CAPLUS  
 CN Benzothiazole, 2,2'-(9,9-diethyl-9H-fluorene-2,7-diyl)bis- (9CI) (CA  
 INDEX NAME)



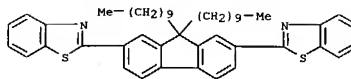
RN 745079-42-9 CAPLUS  
 CN Benzothiazole, 2,2'-(9,9-didecyl-9H-fluorene-2,7-diyl)bis- (9CI) (CA  
 INDEX NAME)

L3 ANSWER 5 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2004:442599 CAPLUS  
 DOCUMENT NUMBER: 141:154786  
 TITLE: Three-photon absorption enhancement in a symmetrical  
 charge transfer fluorene derivative  
 AUTHOR(S): Hernandez, Florencio E.; Belfield, Kevin D.;  
 Cohanoschi, Ion  
 CORPORATE SOURCE: Department of Chemistry and School of  
 Optics/CREOL/FPCE, University of Central Florida,  
 Orlando, FL, 32816-2366, USA  
 SOURCE: Chemical Physics Letters (2004), 391(1-3), 22-26  
 CODEN: CHPLBC; ISSN: 0009-2614  
 PUBLISHER: Elsevier Science B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The authors report the 3-photon absorption-induced upconversion  
 fluorescence emission and the 3-photon absorption cross-section of 2  
 fluorene derivs. with D- $\pi$ -D (9,9-didecyl-2,7-bis-(N,N-  
 diphenylamino)fluorene) and D- $\pi$ -A ((7-benzothiazol-2-yl)-9,9-  
 didecylfluorene-2-yl)diphenylamine structural motifs. The 3-photon  
 absorption cross-section of the D- $\pi$ -D analog ( $\sigma^3 = 82 +$   
 10<sup>-78</sup> cm<sup>6</sup> s<sup>2</sup> photon<sup>-2</sup>) is 2.2 times greater than that of its D- $\pi$ -A  
 counterpart ( $\sigma^3 = 37 + 10<sup>-78</sup> cm<sup>6</sup> s<sup>2</sup> photon<sup>-2</sup>), showing that  
 sym. charge transfer enhances 3PA. The 3-photon-excitation of these 2  
 compds. in hexane solution (9.8 + 10<sup>-3</sup> M) was accomplished with a  
 tunable OPB pumped by picosecond laser pulses. The 3-photon absorption  
 coeffs. were measured using an open aperture Z-scan technique.  
 IT 262607-32-9  
 RL: PRP (Properties)  
 (three-photon absorption enhancement in sym. charge transfer fluorene  
 derivs. optical spectra)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluorene-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI)  
 (CA INDEX NAME)$



REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR  
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L3 ANSWER 4 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)



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 RECORD. ALL CITATIONS AVAILABLE IN THE RE  
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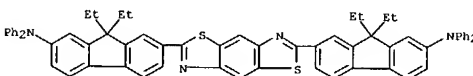
L3 ANSWER 6 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2004:360279 CAPLUS  
 DOCUMENT NUMBER: 140:392334  
 TITLE: Two-photon responsive chromophores containing  
 electron  
 INVENTOR(S): accepting core units  
 Kannan, Ramamurthi; Tan, Loon-seng; Reinhardt, Bruce  
 A.; Vaia, Richard A.  
 PATENT ASSIGNEE(S): The United States of America as Represented by the  
 Secretary of the Air Force, USA  
 SOURCE: U.S., 6 pp.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:  

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6730793	B1	20040504	US 2002-171566	20020613
PRIORITY APPLN. INFO.:			US 2002-171566	20020613

 OTHER SOURCE(S): MARPAT 140:392334  
 GI

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB Chromophores are described by the general formula Q-(L-Z)x (x = 2 or 3;  
 Q  
 is selected from I, II, III, IV, V, and VI; L = VII; R = C1-20 alkyl  
 group; and Z = VIII or IX). The chromophores may exhibit high two-photon  
 absorptions. Thus, 2,5-Bis(7-carbazol-9-yl)-9,9-didecylfluorene-2-yl)-1,3-  
 thiazolo(5,4d)1,3-thiazole was prepared and exhibited  $\beta = 2.8$  cm<sup>2</sup>/GW at  
 0.2 mol/L.  
 IT 685531-21-9P 685531-22-0P  
 RL: SPN (Synthetic preparation); TEM (Technical or engineered material  
 use); PREP (Preparation); USES (Uses)  
 (chromophores with high two-photon absorptions)  
 RN 685531-21-9 CAPLUS  
 CN 9H-Fluorene-2-amine, 7,7'-benzo[1,2-d:4,5-d']bisthiazole-2,6-diylbis[9,9-  
 diethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

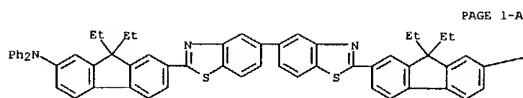


RN 685531-22-0 CAPLUS  
 CN 9H-Fluorene-2-amine, 7,7'-[5,5'-bibenzothiazole]-2,2'-diylbis[9,9-diethyl-  
 N,N-diphenyl- (9CI) (CA INDEX NAME)

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L3 ANSWER 6 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)



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-NPh2

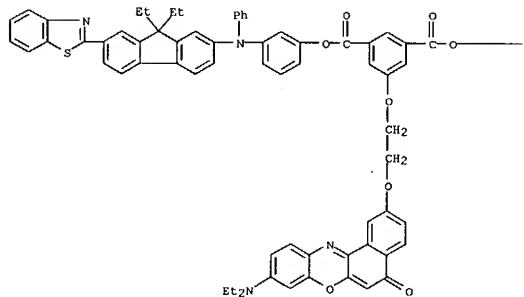
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE  
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L3 ANSWER 7 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2004:344262 CAPLUS  
 DOCUMENT NUMBER: 141:72953  
 TITLE: Fluorescence Resonance Energy Transfer in Novel  
 Multiphoton Absorbing Dendritic Structures  
 AUTHOR(S): Brousmiche, Darryl W.; Serin, Jason M.; Frechet, Jean  
 M. J.; He, Guang S.; Lin, Tzu-Chau; Chung, Sung-Jae;  
 Prasad, Paras N.; Kannan, Ramamurthi; Tan, Loon-Seng  
 CORPORATE SOURCE: Department of Chemistry, University of California,  
 Berkeley, CA, 94720-1460, USA  
 SOURCE: Journal of Physical Chemistry B (2004), 108(25),  
 8592-8600  
 CODEN: JPCBFK; ISSN: 1520-6106  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 141:72953  
 AB A series of small dendritic structures containing one of two efficient  
 the multiphoton absorbing dyes at the periphery and a Nile red derivative at  
 the core have been synthesized. These mols. display efficient (>96%)  
 fluorescence resonance energy transfer (FRET) from the periphery to the  
 core on selective excitation of the two-photon absorbing chromophore by  
 either UV (linear absorption) or high-intensity IR (nonlinear absorption),  
 radiation. In addition, a significant increase in core emission is  
 observed on  
 excitation of the peripheral chromophores, compared to direct excitation  
 of the core. This "antenna effect" essentially doubles between  
 increasing  
 dendrimer generations within a series. The combination of the ability of  
 the peripheral chromophores to absorb high-intensity IR radiation,  
 coupled  
 with a very efficient energy transfer process and a significant increase  
 in the fluorescence of the acceptor chromophore, makes these mols.  
 potentially useful for a variety of applications, including optical power  
 limiting and biomedical imaging.  
 IT 710507-70-3P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (fluorescence resonance energy transfer in Nile Red-based multiphoton  
 absorbing dendritic structures)  
 RN 710507-70-3 CAPLUS  
 CN 1,3-Benzenedicarboxylic acid, 5-[2-[(9-(diethylamino)-5-oxo-5H-  
 benzo[a]phenoxazin-2-yl)oxy]ethoxy]-, bis[3-[(7-(2-benzothiazolyl)-9,9-  
 diethyl-9H-fluoren-2-yl)phenylamino]phenyl] ester (9CI) (CA INDEX NAME)

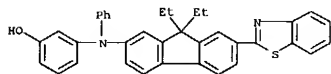
L3 ANSWER 7 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)

PAGE 1-A



PAGE 1-B

IT 710507-66-7  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (fluorescence resonance energy transfer in Nile Red-based multiphoton  
 absorbing dendritic structures)  
 RN 710507-66-7 CAPLUS  
 CN Phenol,  
 3-[[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]phenylamino]-  
 (9CI) (CA INDEX NAME)



REFERENCE COUNT: 49 THERE ARE 49 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE  
 FORMAT

L3 ANSWER 7 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)

L3 ANSWER 8 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN  
 ACCESSION NUMBER: 2004:300925 CAPLUS  
 DOCUMENT NUMBER: 141:30586  
 TITLE: Singlet Oxygen Generation via Two-Photon Excited FRET  
 AUTHOR(S): Dichtel, William R.; Serin, Jason M.; Edder, Carine; Frechet, Jean M. J.; Matuszewski, Michael; Tan, Loon-Seng; Ouhelchiansky, Tynish Y.; Prasad, Paras N.

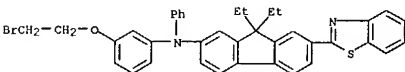
CORPORATE SOURCE: Department of Chemistry, University of California, Berkeley, CA, 94720-1460, USA  
 SOURCE: Journal of the American Chemical Society (2004), 126(17), 5380-5381  
 CODEN: JACSAT; ISSN: 0002-7863  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB A modified porphyrin mol. is studied that has enhanced two-photon absorption (TPA) cross-section. The mol. consists of a dendritic array of

eight donor chromophores capable of two-photon absorption covalently attached to a central porphyrin acceptor. Steady-state fluorescence measurements demonstrated that the donor chromophores transfer excited-state energy to the porphyrin with 97% efficiency. Two-photon excitation of the donor chromophores at 780 nm resulted in a dramatic increase in porphyrin fluorescence relative to a porphyrin model compound. Efficient singlet oxygen generation was observed from oxygen-saturated solns. of this porphyrin compound under two-photon excitation conditions.

Electronic supplementary information (ESI) is available at <http://pubs.acs.org> and contains details and chemical characterization data of the porphyrin compound

IT 700365-35-1  
 RL: PRP (Properties)  
 (model donor chromophore AF-343; singlet oxygen generation via two-photon excitation of sensitizer compound comprising porphyrin acceptor and dendritic array of eight donor chromophores)  
 RN 700365-35-1 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-N-[3-(2-bromoethoxy)phenyl]-9,9-diethyl-N-phenyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE REFORMAT

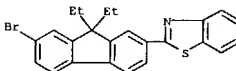
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L3 ANSWER 9 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN  
 ACCESSION NUMBER: 2004:234604 CAPLUS  
 DOCUMENT NUMBER: 141:38865  
 TITLE: Synthesis and characterization of thermally cross-linkable two-photon responsive chromophores

AUTHOR(S): Tan, Loon-Seng; Kannan, Ramamurthi; Dombroskie, Ann G.; Simko, Sharon R.; Houtz, Marlene; He, Guang S.; Lin, Tzu-Chau; Prasad, Paras N.  
 CORPORATE SOURCE: Polymer Branch, AFRL/MLBP, Wright-Patterson Air Force Base, WPAFB, OH, 45433, USA  
 SOURCE: Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2004), 45(1), 901-902  
 CODEN: ACPPAV; ISSN: 0032-3934  
 PUBLISHER: American Chemical Society, Division of Polymer Chemistry  
 DOCUMENT TYPE: Journal; (computer optical disk)  
 LANGUAGE: English

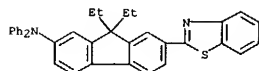
AB Four new cross-linkable two-photon chromophores containing propargylether, methylpropargylether, allylether and methylallylether endgroups were prepared via Pd-catalyzed amination of 3,3'-dimethoxydiphenylamine and 7-benzothiazol-2-yl-9,9-diethyl-2-bromofluorene, followed by demethylation via pyridinium chloride and Williamson reaction with appropriate alkyl bromides in the presence of potassium carbonate in DMF. In comparison with the unfunctionalized analog (AF-240, 9746 GM), their effective, nanosecond two-photon cross-sections ranging from 6560 to 10,400 GM (1 GM=10<sup>-50</sup> cm<sup>4</sup> s / photon-mol.) were mostly unaffected by having allylether or propargylether functions at the 3,3'-positions of the diphenylamino group. Thermal anal. results indicated that they could be thermally polymerized, and higher degrees of curing could be achieved in air than under inert atmospheric. The influence of thermal curing on their linear and nonlinear properties is the subject of future studies.

IT 225113-41-7  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (In preparation and characterization of thermally cross-linkable two-photon responsive chromophores)  
 RN 225113-41-7 CAPLUS  
 CN Benzothiazole, 2-(7-bromo-9,9-diethyl-9H-fluoren-2-yl)- (9CI) (CA INDEX NAME)

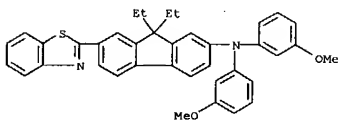


IT 222617-85-8P 701971-73-5P 701971-75-7P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

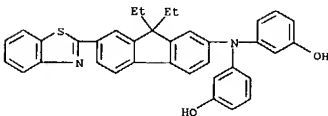
L3 ANSWER 9 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN (Continued)  
 (in prepn. and characterization of thermally cross-linkable two-photon responsive chromophores)  
 RN 222617-85-8 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



RN 701971-73-5 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl-N,N-bis(3-methoxyphenyl)- (9CI) (CA INDEX NAME)

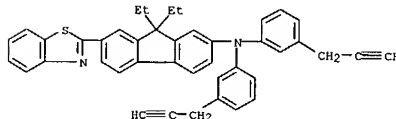


RN 701971-75-7 CAPLUS  
 CN Phenol, 3,3'-[[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]imino]bis- (9CI) (CA INDEX NAME)

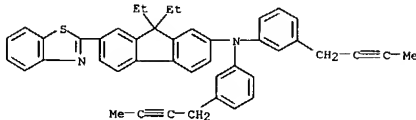


IT 701971-78-0P 701971-81-5P 701971-84-8P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (monomer; preparation and characterization of thermally cross-linkable two-photon responsive chromophores)  
 RN 701971-78-0 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl-N,N-bis[3-(2-propynyl)phenyl]- (9CI) (CA INDEX NAME)

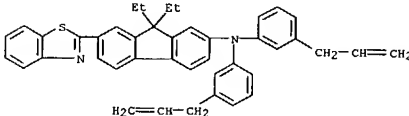
L3 ANSWER 9 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN (Continued)



RN 701971-81-5 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-N,N-bis[3-(2-butyryl)phenyl]-9,9-diethyl- (9CI) (CA INDEX NAME)



RN 701971-84-8 CAPLUS  
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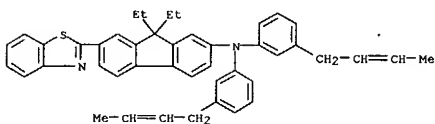
RN 701971-87-1 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-N,N-bis[3-(2-butenyl)phenyl]-9,9-diethyl- (9CI) (CA INDEX NAME)



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L3 ANSWER 9 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)



REFERENCE COUNT: 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RECORD.

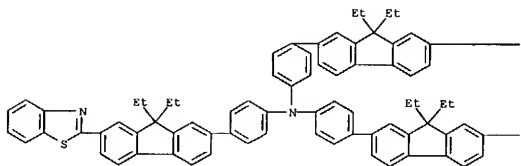
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L3 ANSWER 10 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN

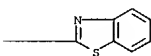
ACCESSION NUMBER: 2004:210510 CAPLUS  
DOCUMENT NUMBER: 140:414514  
TITLE: Degenerate two-photon-absorption spectral studies of highly two-photon active organic chromophores  
AUTHOR(S): He, Guang S.; Lin, Tzu-Chau; Dai, Jianming; Prasad, Paras N.; Kannan, Ramamurthi; Dombroskie, Ann G.; Vaia, Richard A.; Tan, Loon-Seng  
CORPORATE SOURCE: Photonics and Biophotonics, Institute for Lasers, State University of New York at Buffalo, Buffalo, NY, 14260-3000, USA  
SOURCE: 5275-5284  
CODEN: JCPSA6; ISSN: 0021-9606  
PUBLISHER: American Institute of Physics  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB Degenerate two-photon absorption (TPA) spectral properties of five AFK chromophore solns. have been studied using a single and spectrally dispersed sub-picosecond white-light continuum beam. In a specially designed optical configuration, optical pathways inside the sample solution for different spectral components of the focused continuum beam were spatially separated from each other. Thus, the nondegenerate TPA processes coming from different spectral components can be eliminated, and the direct nonlinear absorption spectrum attributed to degenerate TPA processes can be readily obtained. Using this new technique, the complete TPA spectra for these five highly two-photon-active compds. (AF-380, AF-350, AF-295, AF-270, and AF-50) were obtained in the spectral range from 600 to 950 nm on an absolute scale of TPA cross section. The relationship between the mol. structures and their TPA spectral behaviors are discussed. In general the measured TPA spectra are not identical with the linear absorption spectra on the scale of absorbed photon(s) energy. Moreover, for some sample (such as AF-380), the TPA spectrum is totally different from the linear spectrum, which implies the difference of mol. transition pathways and selection rules for one- and two-photon excitation processes. At high excitation intensity levels ( $\geq 15$  GW/cm<sup>2</sup>), the saturation behavior of TPA transition can be observed obviously in AF-350 and AF-380 solns. that exhibit much higher nonlinear absorptivity than the other chromophores investigated.  
IT 267667-11-8, AF 350 287493-07-6 364635-66-5 364635-72-3  
RL: PRP (Properties)  
(Degenerate two-photon-absorption spectral studies of highly two-photon active dialkylfluorene-based chromophores)  
RN 267667-11-8 CAPLUS  
CN Benzenamine, 4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-N,N-bis[4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]phenyl]- (9CI) (CA INDEX NAME)

L3 ANSWER 10 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)

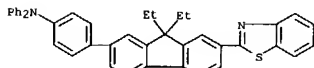
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PAGE 1-B

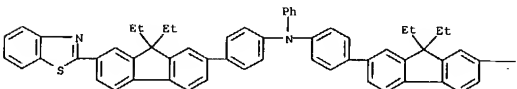


RN 287493-07-6 CAPLUS  
CN Benzenamine, 4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-N,N-bis[4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]phenyl]-N-phenyl- (9CI) (CA INDEX NAME)



RN 364635-66-5 CAPLUS  
CN Benzenamine, 4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-N-[4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]phenyl]-N-phenyl- (9CI) (CA INDEX NAME)

PAGE 1-A

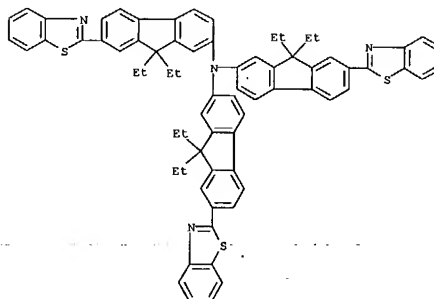


L3 ANSWER 10 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)

PAGE 1-B



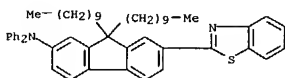
RN 364635-72-3 CAPLUS  
CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-N,N-bis[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-9,9-diethyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 73 THERE ARE 73 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RECORD.

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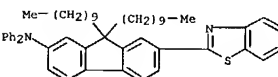
L3 ANSWER 11 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN  
 ACCESSION NUMBER: 2004:165037 CAPLUS  
 DOCUMENT NUMBER: 141:96518  
 TITLE: Photochemical properties of (7-benzothiazol-2-yl-9,9-didecylfluoren-2-yl)diphenylamine under one- and two-photon excitation  
 AUTHOR(S): Belfield, Kevin D.; Bondar, Mykhailo V.; Przhonska, Olga V.; Schafer, Katherine J.  
 CORPORATE SOURCE: Department of Chemistry and School of Optics/CREOL, University of Central Florida, Orlando, FL, 32816-2366, USA  
 SOURCE: Journal of Photochemistry and Photobiology, A: Chemistry (2004), 162(2-3), 569-574  
 CODEN: JPPEJ; ISSN: 1010-6030  
 PUBLISHER: Elsevier Science B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The photochem. properties of the fluorene derivative (7-benzothiazol-2-yl-9,9-didecylfluoren-2-yl)diphenylamine (I) in hexane and CH<sub>2</sub>Cl<sub>2</sub> were studied under linear (one-photon) and nonlinear (two-photon) excitation. The quantum yield of the photochem. reaction,  $\Phi$ , for I in hexane was in the range  $(3.5-5) \times 10^{-5}$  for one-photon excitation (UVGL-25 and Xe-lamps) and was nearly the same under two-photon excitation (femtosecond laser with pulse duration 120 fs, average power .apprx.10 mW, repetition rate f=1 kHz). The values of  $\Phi$  in CH<sub>2</sub>Cl<sub>2</sub> were  $(2.5-4) \times 10^{-5}$  for one-photon excitation and increased 50-80 times under two-photon excitation. This increase can be explained by an addnl. one-photon absorption process from the first electronically excited state, resulting in the observed enhancement in photochem. decomposition  
 IT 262607-32-9  
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent) (photochem. properties of (7-benzothiazol-2-yl-9,9-didecylfluoren-2-yl)diphenylamine under one- and two-photon excitation)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS  
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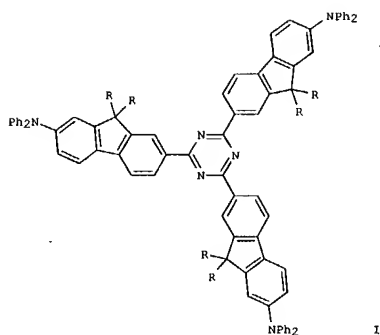
L3 ANSWER 12 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN  
 ACCESSION NUMBER: 2004:165020 CAPLUS  
 DOCUMENT NUMBER: 141:130452  
 TITLE: Two-photon absorption cross-sections of common photoinitiators  
 AUTHOR(S): Schafer, Katherine J.; Hales, Joel M.; Balu, Mihaela; Belfield, Kevin D.; Van Stryland, Eric W.; Hagan, David J.  
 CORPORATE SOURCE: Department of Chemistry, University of Central Florida, Orlando, FL, 32826, USA  
 SOURCE: Journal of Photochemistry and Photobiology, A: Chemistry (2004), 162(2-3), 497-502  
 CODEN: JPPEJ; ISSN: 1010-6030  
 PUBLISHER: Elsevier Science B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Recent interests in and applications of two-photon absorption (2PA) induced photopolym. have afforded advanced opportunities to perform three-dimensionally resolved polymerization, resulting in intricate microfabrication and imaging. Many of the reported 2PA-induced polymns. make use of com. available photoinitiators, and a key parameter to consider is the two-photon absorption cross-section ( $\delta$ ) of the initiator. To date, there has been no comprehensive investigation of two-photon absorptivity of com. photoinitiators, though a few studies presenting novel photoinitiators for two-photon polymerization have appeared. The authors report the 2PA properties of common, com. available photoinitiators typically utilized in conventional radiation curing science and technologies, and often used in 2PA-based polymns. Z-scan and white-light continuum (WLC) pump-probe techniques were utilized to obtain two-photon absorption cross-sections ( $\delta$ ). The results for most compds. were found to yield good agreement between the two methods. Most of the photoinitiators studied possess low  $\delta$ , except Irgacure OXE01, indicating a need for the development of new photoinitiators with improved properties optimized for 2PA applications. A compound prepared in our labs. exhibits high 2PA and was useful as a two-photon free-radical photoinitiator.  
 IT 262607-32-9, DPABz  
 RL: PRP (Properties) (DPABz: two-photon absorption cross-sections of common photopolymn. photoinitiators measured by Z-scan and white-light continuum pump-probe techniques)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

L3 ANSWER 13 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN  
 ACCESSION NUMBER: 2004:165018 CAPLUS  
 DOCUMENT NUMBER: 141:233070  
 TITLE: Photostability of a series of two-photon absorbing fluorene derivatives  
 AUTHOR(S): Belfield, Kevin D.; Bondar, Mykhailo V.; Przhonska, Olga V.; Schafer, Katherine J.  
 CORPORATE SOURCE: Department of Chemistry and CREOL/School of Optics, University of Central Florida, Orlando, FL, 32816-2366, USA  
 SOURCE: Journal of Photochemistry and Photobiology, A: Chemistry (2004), 162(2-3), 489-496  
 CODEN: JPPEJ; ISSN: 1010-6030  
 PUBLISHER: Elsevier Science B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The photochem. stability of a series of two-photon absorbing (TPA) fluorene derivs. was investigated in air- and N<sub>2</sub>-saturated acetonitrile (ACN) at room temperature. The quantum yields of the photoreactions,  $\Phi$ , were determined at various concns. of the fluorene derivs., oxygen concentration of the solvent, and irradiation wavelength. The absorption and fluorescence spectra of the photoproducts, corresponding to different excitation conditions, were analyzed. Photooxidn. and electron transfer processes are proposed as photobleaching mechanisms for the fluorene derivs. in ACN. The relatively low photochem. quantum yields ( $\Phi$  .apprx.10<sup>-4</sup>) make the derivs. particularly promising for linear and nonlinear optical applications.  
 IT 262607-32-9  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent) (photochem. properties of two-photon absorbing fluorene derivs. in acetonitrile solution as function of concentration and oxygen content and irradiation wavelength)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS  
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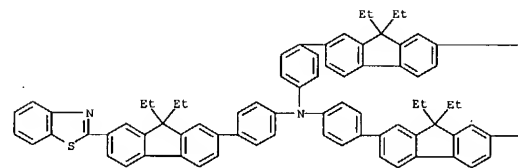
L3 ANSWER 14 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2003:935949 CAPLUS  
 DOCUMENT NUMBER: 140:94017  
 TITLE: Toward Highly Active Two-Photon Absorbing Liquids. Synthesis and Characterization of  
 1,3,5-Triazine-Based  
 Octupolar Molecules  
 AUTHOR(S): Kannan, Ramamurthi; He, Guang S.; Lin, Tzu-Chau; Prasad, Paras N.; Vaia, Richard A.; Tan, Loon-Seng  
 CORPORATE SOURCE: Systran Systems Corporation, Dayton, OH, 45432, USA  
 SOURCE: Chemistry of Materials (2004), 16(1), 105-194  
 CODEN: CMATEX; ISSN: 0897-4756  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 140:94017  
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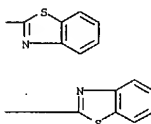
AB Novel two-photon absorbing chromophores I [R = Me(CH<sub>2</sub>)<sub>9</sub>, Me<sub>2</sub>CHCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CHMeCH<sub>2</sub>CH<sub>2</sub>, H<sub>2</sub>C=CHCH<sub>2</sub>] are prepared containing 1,3,5-triazine  $\pi$ -electron deficient cores, dialkylfluorene aromatic bridges, and diphenylamino electron-donating end-groups. I [R = Me(CH<sub>2</sub>)<sub>9</sub>] possesses a high effective two-photon absorption cross-section ( $\sigma_{2\gamma} = 39\,500 + 10\text{--}50\text{ cm}^4\text{-sec/photon-mol.}$ , or  $39\,500\text{ GM}$ ) as determined by nonlinear transmission in the nanosecond regime at 800 nm, while I [R = Me<sub>2</sub>CHCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CHMeCH<sub>2</sub>CH<sub>2</sub>], a mixture of stereoisomers with the same chemical

L3 ANSWER 14 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)  
 formula as I [R = Me(CH<sub>2</sub>)<sub>9</sub>], is a glassy material that becomes fluid (molasses-like) upon heating at 70–80 °C and has a noticeably smaller effective two-photon absorption cross-section ( $33\,300\text{ GM}$ ). I [R = H<sub>2</sub>C=CHCH<sub>2</sub>] has a lower effective two-photon absorption cross-section than I [Me(CH<sub>2</sub>)<sub>9</sub>, Me<sub>2</sub>CHCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CHMeCH<sub>2</sub>CH<sub>2</sub>] ( $\sigma_{2\gamma} = 27\,800\text{ GM}$ ) but is prep. as a precursor to two-photon absorbing liqs. The intrinsic two-photon absorption cross-sections of I are also detd. as a function of excitation wavelengths via a femtosecond white-light continuum generation and direct degenerate-TPA measurement technique. At the two-photon absorption peaks .apprx.779 nm, their effective two-photon absorption cross-section values are 216, 214, and 199 GM ( $\pm 15\%$ ) for I [R = Me(CH<sub>2</sub>)<sub>9</sub>, Me<sub>2</sub>CHCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CHMeCH<sub>2</sub>CH<sub>2</sub>, H<sub>2</sub>C=CHCH<sub>2</sub>], resp.  
 IT 267667-11-8 364635-72-3  
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)  
 (preparation of octupolar mols. with 1,3,5-triazine cores, 9,9-dialkylfluorene linkers and diarylamine termini as potential two-photon absorbing chromophores and liqs. and comparison to previous chromophores)  
 RN 267667-11-8 CAPLUS  
 CN Benzenamine, 4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-N,N-bis[4-(7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl)phenyl]- (9CI) (CA INDEX NAME)

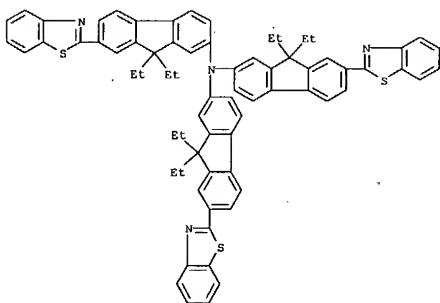
PAGE 1-A



PAGE 1-B



L3 ANSWER 14 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)  
 RN 364635-72-3 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-N,N-bis[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-9,9-diethyl- (9CI) (CA INDEX NAME)



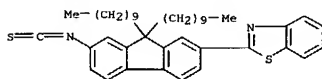
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 ACCESSION NUMBER: 2003:891025 CAPLUS  
 DOCUMENT NUMBER: 141:170155  
 TITLE: Reactive two-photon fluorescent probes for biological imaging  
 AUTHOR(S): Belfield, Kevin D.; Schafer, Katherine J.; Yao, Sheng; Hales, Joel M.; Hagan, David J.; Van Styland, Eric W.  
 CORPORATE SOURCE: Department of Chemistry, Univ. of Central Florida, Orlando, FL, 32816, USA  
 SOURCE: Proceedings of SPIE-The International Society for Optical Engineering (2003), 5211(Nonlinear Optical Transmission and Multiphoton Processes in Organics), 91-95  
 CODEN: PRISDG; ISSN: 0277-786X  
 PUBLISHER: SPIE-The International Society for Optical Engineering  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Two-photon fluorescence microscopy is a prominent tool in biol. imaging anal. Many com. available fluorescent dyes currently being used have sufficed for multiphoton based imaging of biol. samples. While measured two-photon cross-sections (in Goppert Meyer, GM units) of some of the dyes are available, many exhibit relatively low two-photon cross-section values in the tunability range of Ti:sapphire lasers commonly used in multiphoton microscopy imaging. For example, Bodipy FL exhibits a maximum GM unit of 18 at 925 nm, compared to a range of 2-4 GM units from 775-875 nm. Furthermore, available fluorophores may be plagued with either low fluorescence quantum yield and/or the addnl. problem of rapid photobleaching upon exposure to the high peak power provided by the fs laser source. In order to address the demand for better performing dyes for two-photon based imaging, we have prepared a new series of reactive fluorophores tailored for multiphoton imaging. These fluorophores are based upon the fluorene ring system, known to exhibit high fluorescence quantum yields, typically > 0.7, and possess high photostability. They have been functionalized with various moieties to act, e.g., as efficient amine-reactive fluorescent probes for the covalent attachment onto amine-containing biomols. Single-photon spectral characteristics, as well as measured two-photon cross sections of a reactive fluorophore and its conjugate in solution, as well as spectral characterizations of a bovine serum albumin (BSA) conjugate are presented.  
 IT 733045-02-8  
 RL: ARU (Analytical role, unclassified); RCT (Reactant); ANST (Analytical study); RACT (Reactant or reagent)  
 (reactive two-photon fluorescent probes for biol. and protein imaging)  
 RN 733045-02-8 CAPLUS  
 CN Benzo[thiazole, 2-(9,9-didecyl-7-isothiocyanato-9H-fluoren-2-yl)- (9CI) (CA INDEX NAME)

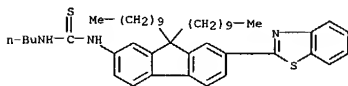
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L3 ANSWER 15 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)



IT 733045-03-9P  
 RL: ARU (Analytical role, unclassified); SPN (Synthetic preparation);  
 ANST (Analytical study); PREP (Preparation)  
 (reactive two-photon fluorescent probes for biol. and protein imaging)  
 RN 733045-03-9 CAPLUS  
 CN Thiourea, N-(7-(2-benzothiazolyl)-9,9-didecyl-9H-fluoren-2-yl)-N'-butyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR  
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L3 ANSWER 16 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN

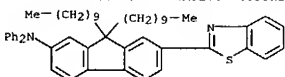
ACCESSION NUMBER: 2003:891017 CAPLUS  
 DOCUMENT NUMBER: 141:196943  
 TITLE: Nonlinear optical spectroscopic characterization of a series of fluorene derivatives  
 AUTHOR(S): Hales, Joel M.; Schafer, Katherine J.; Morales, Alma M.; Belfield, Kevin D.; Hagan, David J.; Van  
 Stryland,

CORPORATE SOURCE: Eric W.  
 School of Optics/CREOL, Univ. of Central Florida,  
 Orlando, FL, 32816, USA  
 SOURCE: Proceedings of SPIE-The International Society for  
 Optical Engineering (2003), 5211(Nonlinear Optical  
 Transmission and Multiphoton Processes in Organics),  
 21-30  
 CODEN: PSISDG; ISSN: 0277-786X  
 SPIE-The International Society for Optical

PUBLISHER: Engineering  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The authors have performed nonlinear spectroscopic measurements to study the chemical structure/nonlinear optical property relations for a set of alkyl fluorene derivs. The characterization method the authors used is a femtosecond white-light continuum (WLC) pump-probe spectrometer that can rapidly characterize an organic samples nondegenerate two-photon absorption (2PA) spectrum. The nature of these expts. requires sophisticated data anal. In particular, the relative group velocity mismatch between the pump and probe, which are at different frequencies, makes these pulses walk through each other within the thickness of the sample. For widely different frequencies, this can severely diminish the 2PA signal strength. However, given careful anal., the authors found good agreement with known semiconductor samples. Confidence in this method has allowed the authors to study the effects of solvent effect, electron-withdrawing character, conjugation length, and symmetry on the two-photon absorbing properties of these mols. The authors found an optimum solvent polarity as well as electron-withdrawing character which serves to maximize the strength of the 2PA in these materials. Different synthesis avenues provided the authors with two different methods of extending the conjugation length that increases the nonlinearity as well. Finally, studies of mols. with disparate symmetry have allowed the authors to identify the symmetry of the excited states. The authors present the 1st exptl. study of the intermediate state resonance enhancement of nondegenerate 2PA in organic mols. Using a simplified sum-over-states expression, the authors make comparisons between experiment and theory.

IT 262607-32-9  
 RL: PRP (Properties)  
 (nonlinear optical spectroscopic characterization of a series of fluorene derivs.)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

L3 ANSWER 16 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)

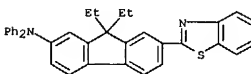


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L3 ANSWER 17 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN

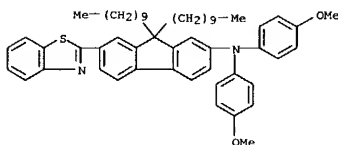
ACCESSION NUMBER: 2003:702370 CAPLUS  
 DOCUMENT NUMBER: 140:41640  
 TITLE: Influence of electron-acceptor strength on the resonant two-photon absorption cross sections of diphenylaminofluorene-based chromophores  
 AUTHOR(S): Guo, Jing-Dong; Wang, Chuan-Kui; Luo, Yi; Agren, Hans  
 CORPORATE SOURCE: Theoretical Chemistry, SCFAB, Royal Institute of Technology, Stockholm, S-10691, Swed.  
 SOURCE: Physical Chemistry Chemical Physics (2003), 5(18), 3869-3873  
 CODEN: PPCPGQ; ISSN: 1463-9076  
 PUBLISHER: Royal Society of Chemistry  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB Resonant two-photon absorption (TPA) cross sections of a series of diphenylaminofluorene-based chromophores with various electron acceptors are predicted using the RPA and using hybrid d. functional theory implemented for a two-state model. A comparison of the two methods indicates that the two-state model is adequate for describing the TPA cross sections of all asym. charge-transfer systems under investigation. It is demonstrated that the inclusion of electron correlation can drastically increase the absolute values of the TPA cross sections, but that it has negligible effects on the relative order of the TPA activity of the mols.  
 IT 222617-85-8, AF-240  
 RL: PRP (Properties)  
 (influence of electron-acceptor strength on resonant two-photon absorption cross sections of diphenylaminofluorene-based chromophores)  
 RN 222617-85-8 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



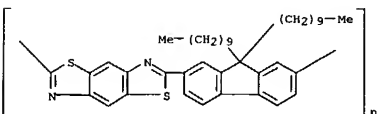
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L3 ANSWER 18 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2003:381591 CAPLUS  
 DOCUMENT NUMBER: 138:338848  
 TITLE: Nondestructive multiphoton fluorescence imaging of polymeric materials  
 AUTHOR(S): Belfield, Kevin D.; Schafer, Katherine J.; Van Stryland, Eric W.  
 CORPORATE SOURCE: Dep. of Chem., Univ. of Central Florida, Orlando, FL, 32816, USA  
 SOURCE: Polymeric Materials Science and Engineering (2001), 84, 1010-1011  
 CODEN: PMSEGD; ISSN: 0743-0515  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The design of efficient multiphoton absorbing chromophores, their photophys. properties, and uses in three-dimensional, nondestructive multiphoton fluorescence imaging of polymeric materials, e.g., fibrin, synthetic polymers, are described. The method is illustrated with imaging of a fluorophore mixture with poly(Me methacrylate).  
 IT 289892-09-7  
 RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses) (chromophore imaging agent; fluorene-based fluorophores for nondestructive multiphoton fluorescence imaging of polymeric materials)  
 RN 289892-09-7 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-bis(4-methoxyphenyl)- (9CI) (CA INDEX NAME)



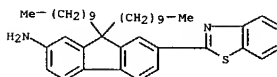
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L3 ANSWER 20 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2003:381184 CAPLUS  
 DOCUMENT NUMBER: 138:354537  
 TITLE: Luminescence and multiphoton absorption of a new class of bisbenzothiazole polymer  
 AUTHOR(S): Belfield, Kevin D.; Morales, Alma; Yavuz, Ozlem; Stegeman, George I.; Chapela, Victor M.; Percino, Judith  
 CORPORATE SOURCE: Department of Chemistry and School of Optics, University of Central Florida, Orlando, FL, 32816, USA  
 SOURCE: Polymeric Materials Science and Engineering (2001), 84, 660-661  
 CODEN: PMSEGD; ISSN: 0743-0515  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The ease of synthesis, high two-photon absorptivity, and fluorescence properties makes fluorenyl bisbenzothiazole polymer a good candidate for optical power limiting and two-photon fluorescence imaging. Thus, 2,7-dicyano-9,9-didecylfluorene (0.0014 mol, preparation given), 2,5-diamino-1,4-benzenedithiol dihydrochloride (0.0014 mol), and polyphosphoric acid (3.75 g) were stirred, flushed with N (g), heated to 45° under vacuum, stirred for 16 h, the temperature gradually raised to 60° for 4 h, and 100° for 2 h, resulting in the reaction mixture turning orange, cooled to room temperature and 1.83 g P2O5 was added, the solution was then slowly heated to 100° and stirred for 16 h (reddish-orange solution), followed by heating to 130° for another 16 h, then at 145° for 6 h, cooled in water, neutralized with NH4OH (20%) and washed with water in a soxhlet extractor for 32 h to give polymer which was dried and again washed with hexane, yielding a yellow solid (0.49 g, yield 53%).  
 IT 518357-48-7P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (luminescence and multiphoton absorption of fluorenyl bisbenzothiazole polymer)  
 RN 518357-48-7 CAPLUS  
 CN Poly[benzo[1,2-d:4,5-d']bis(benzothiazole-2,6-diyl(9,9-didecyl-9H-fluorene-2,7-diyl)] (9CI) (CA INDEX NAME)



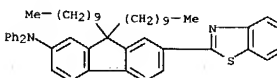
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L3 ANSWER 19 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2003:381432 CAPLUS  
 DOCUMENT NUMBER: 138:338686  
 TITLE: Maleic anhydride-modified polymers for two-photon upconverted fluorescence  
 AUTHOR(S): Belfield, Kevin D.; Andrasik, Stephen; Schafer, Katherine J.; Yavuz, Ozlem; Hales, Joel M.; Van Stryland, Eric W.  
 CORPORATE SOURCE: Dep. of Chem., Univ. of Central Florida, Orlando, FL, 32816, USA  
 SOURCE: Polymeric Materials Science and Engineering (2001), 84, 732-733  
 CODEN: PMSEGD; ISSN: 0743-0515  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Simultaneous two-photon absorption is a process in which the probability of a ground to excited state transition scales quadratically with incident intensity of the irradiation source. This nonlinear or quadratic dependence makes two-photon excitation particularly attractive for use in a number of emerging technologies, including two-photon fluorescence imaging, three-dimensional micro-fabrication, and optical power limiting. We wish to report the synthesis and photophys. characterization of polymers bearing chromophores that exhibit high two-photon absorptivity. Polymers derived from copolym. with maleic anhydride or through grafting of maleic anhydride were modified with primary amine-containing two-photon fluorophores, affording the corresponding imides. Photophys. properties including, linear absorption, excited state lifetime, single photon fluorescence, and two-photon upconverted fluorescence emission spectra are reported.  
 IT 262607-30-7P, 7-(2-Benzothiazolyl)-9,9-didecyl-2-fluorenylamine  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (benzothiazolyl fluorenylamine-modified polymers for two-photon upconverted fluorescence)  
 RN 262607-30-7 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl- (9CI) (CA INDEX NAME)



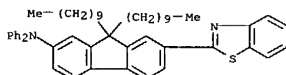
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L3 ANSWER 21 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2003:293006 CAPLUS  
 DOCUMENT NUMBER: 139:36200  
 TITLE: Chemical structure/nonlinear optical property relations for fluorenyl ring system derivatives  
 AUTHOR(S): Hales, J.; Schafer, K. J.; Morales, A. M.; Belfield, K. D.; Hagan, D. J.; Van Stryland, E. W.  
 CORPORATE SOURCE: School of Optics/CREOL, University of Central Florida, Orlando, FL, 32816-2700, USA  
 SOURCE: Trends in Optics and Photonics (2002), 79(Nonlinear Optics), 369-371  
 CODEN: TOPRBS  
 PUBLISHER: Optical Society of America  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB We present initial work involving chemical-structure/nonlinear-optical (NLO) property relations for a set of fluorene derivs. This is achievable using our femtosecond white-light continuum pump-probe nonlinear spectrometer which can rapidly characterize a sample's two-photon absorption spectrum.  
 IT 262607-32-9  
 RL: PRP (Properties) (chemical structure-nonlinear optical property relations for fluorenyl ring system derivs.)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE  
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L3 ANSWER 22 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2002:924150 CAPLUS  
 DOCUMENT NUMBER: 138:287182  
 TITLE: Steady-State Spectroscopic and Fluorescence Lifetime Measurements of New Two-Photon Absorbing Fluorene Derivatives  
 AUTHOR(S): Belfield, Kevin D.; Bondar, Mikhailo V.; Przhonska, Olga V.; Schafer, Katherine J.  
 CORPORATE SOURCE: Department of Chemistry, University of Central Florida, Orlando, FL, USA  
 SOURCE: Journal of Fluorescence (2002), 12(3/4), 449-454  
 CODEN: JOFLEN; ISSN: 1053-0509  
 PUBLISHER: Kluwer Academic/Plenum Publishers  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Steady-state excitation anisotropy, lifetimes, and time-resolved emission spectra of new 2-photon absorbing fluorene derivs. [(7-benzothiazol-2-yl-9,9-didecylfluorene-2-yl)diphenylamine, 9,9-didecyl-2,7-bis(N,N-diphenylamino)fluorene, and [4-[2-(7-diphenylamino-9,9-diethylfluorene-2-yl)-vinyl]phenyl]phosphoric acid di-Et ester] were measured in aprotic solvents at room temperature. Excitation anisotropy spectra in viscous silicon oil allowed the determination of the spectral position of three electronic transitions S0 S1, S0 S2, S0 S3 (Si, i = 1, 2, 3 are the singlet electronic states) and the angles (.simeq. 30°) between absorption S0 S1 and emission S1 S0 dipole moments for the first electronic transition. Solvate relaxation processes in the first excited state of the investigated fluorene mols. affect the lifetimes of these states,  $\tau_1$ , so that exptl. values of  $\tau_1$  do not correspond to those calculated by Strickler and Berg theory. The influence of the mol. concentration on the fluorescence quantum yields and  $\tau_1$  have been investigated.  
 IT 262607-32-9  
 RL: PRP (Properties)  
 (steady-state spectroscopic and fluorescence lifetime measurements of new two-photon absorbing fluorene derivs.)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluorene-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

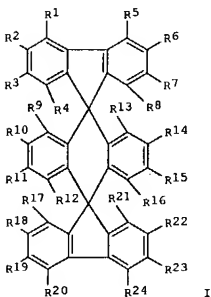


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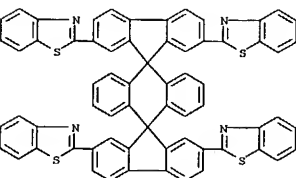
L3 ANSWER 23 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2002:849756 CAPLUS  
 DOCUMENT NUMBER: 137:360139  
 TITLE: Double-spiro organic compounds and electroluminescent devices  
 INVENTOR(S): Kim, Kong-Kyeum; Son, Se-Hwan; Yoon, Seok-Hee; Bae, Jae-Soon; Lee, Youn-Gu; Im, Sung-Gap; Kim, Ji-Eun; Lee, Jae-Chol  
 PATENT ASSIGNEE(S): LG Chem, Ltd., S. Korea  
 SOURCE: PCT Int. Appl. 117 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002088274	A1	20021107	WO 2002-KR458	20020318
W: CN, JP				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
KR 2002083614	A	20021104	KR 2001-23038	20010427
KR 2002083615	A	20021104	KR 2001-23039	20010427
US 2004023060	A1	20040205	US 2002-99781	20020314
EP 1294823	A1	20030326	EP 2002-705589	20020318
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
JP 2004529937	T2	20040930	JP 2002-585559	20020318
US 2004170863	A1	20040902	US 2003-718083	20031119
PRIORITY APPLN. INFO.:				
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			KR 2001-23039	A 20010427
			US 2002-99781	A3 20020314
			WO 2002-KR458	W 20020318
OTHER SOURCE(S): MARPAT 137:360139				
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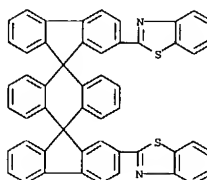
L3 ANSWER 23 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)



AB Double-spiro organic compds. are claimed which are described by the general formula I (R1-24 = independently selected substituents not all of which are H). Light-emitting, hole-transporting, and electron-transporting materials comprising the compds. are also described. Electroluminescent materials comprising the compds, including deposited films, methods for depositing the materials, and organic electroluminescent devices employing the materials, and method for fabricating the devices, are also described.  
 IT 474688-44-3 474688-46-5  
 RL: DEV (Device component use); USES (Uses)  
 (double-spiro organic compds. and electroluminescent devices using them)  
 RN 474688-44-3 CAPLUS  
 CN Benzo[thiazole, 2,2',2'',2'''-dispiro[9H-fluorene-9,9'(10'H)-anthracene-10',9''-[9H]fluorene]-2,2''',7,7'''-tetrayltetrakis- (9CI) (CA INDEX NAME)



L3 ANSWER 23 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)  
 RN 474688-46-5 CAPLUS  
 CN Benzo[thiazole, 2,2'-dispiro[9H-fluorene-9,9'(10'H)-anthracene-10',9''-[9H]fluorene]-2,2'''-diylbis- (9CI) (CA INDEX NAME)

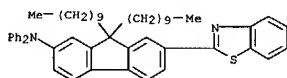


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L3 ANSWER 24 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2002:673937 CAPLUS  
 DOCUMENT NUMBER: 137:359662  
 TITLE: Experiment and analysis of two-photon absorption spectroscopy using a white-light continuum probe  
 AUTHOR(S): Negres, Raluca A.; Hales, Joel M.; Kobayakov, Andrey; Hagan, David J.; Van Stryland, Eric W.  
 CORPORATE SOURCE: School of Optics/CREOL, University of Central Florida,  
 Florida,  
 SOURCE: Orlando, FL, 32816-2700, USA  
 IEEE Journal of Quantum Electronics (2002), 38(9), 1205-1216  
 CODEN: IEJQA7; ISSN: 0018-9197  
 PUBLISHER: Institute of Electrical and Electronics Engineers  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The authors present an exptl. technique along with the method of data anal. to give nondegenerate 2-photon absorption (2PA) spectra. The authors use a femtosecond pump pulse and a white-light continuum (WLC) probe to rapidly generate the 2PA spectra of a variety of materials. To analyze data taken with this method, the spectral and temporal characteristics of the WLC must be known, along with the linear dispersion of the sample. This allows determination of the temporal walk-off of the pump and probe pulses as a function of frequency caused by group-velocity mismatch. Data correction can then be performed to obtain the nonlinear losses. The authors derive an anal. formula for the normalized nonlinear transmittance that is valid under quite general exptl. parameters. The authors verify this on ZnS and use it for the determination of 2PA spectra of some organic compds. in solution. The authors also compare some of the data on orgs. with 2-photon fluorescence data and find good agreement.  
 IT 262607-32-9  
 RL: PRP (Properties)  
 (two-photon absorption spectroscopy using white-light continuum probe in relation to electrooptical Kerr effect)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI)  
 (CA INDEX NAME)

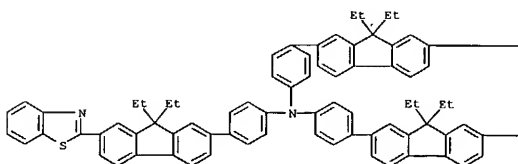


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L3 ANSWER 24 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)

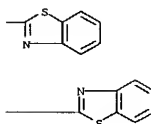
L3 ANSWER 25 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2002:647374 CAPLUS  
 DOCUMENT NUMBER: 138:106347  
 TITLE: Synthesis of C60-diphenylaminofluorene dyad with large  
 2PA cross-sections and efficient intramolecular two-photon energy transfer  
 AUTHOR(S): Chiang, Long Y.; Padmawar, Prashant A.; Canteenwala, Taizoon; Tan, Loon-Seng; He, Guang S.; Kannan, Ramamurthi; Vaia, Richard; Lin, Tzu-Chau; Zheng, Qingdong; Prasad, Paras N.  
 CORPORATE SOURCE: Institute of Nanoscience and Engineering, Department of Chemistry, University of Massachusetts Lowell, Lowell, MA, 01854, USA  
 SOURCE: Chemical Communications (Cambridge, United Kingdom) (2002), (17), 1854-1855  
 CODEN: CHCOFS; ISSN: 1359-7345  
 PUBLISHER: Royal Society of Chemistry  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 138:106347  
 AB The first, highly two-photon active C60 derivative comprised of a A-sp3-D conjugate structure was synthesized showing effective two-photon absorption cross-sections ( $\sigma_2' = 196 + 10^{-48} \text{ cm}^4 \text{ sec}^{-1} \text{ mol}^{-1}$ ) in the nanosecond regime among the best values for diphenylaminofluorene-based AFX chromophores.  
 IT 267667-11-8, AF 350 487017-31-2, AF 284  
 RL: PRP (Properties)  
 (2PA cross-section; synthesis of C60-diphenylaminofluorene dyad with large 2PA cross-sections and efficient intramol. two-photon energy transfer)  
 RN 267667-11-8 CAPLUS  
 CN Benzenamine, 4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-N,N-bis[4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]phenyl]- (9CI)  
 (CA INDEX NAME)

PAGE 1-A

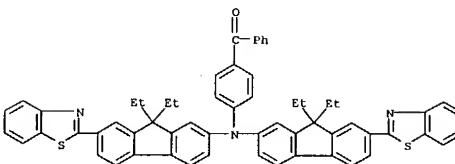


L3 ANSWER 25 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)

PAGE 1-B



RN 487017-31-2 CAPLUS  
 CN Methanone, [4-bis[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]amino]phenylphenyl- (9CI) (CA INDEX NAME)

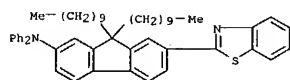


REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS  
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09/11/2004

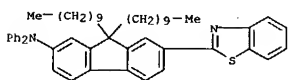
10784312

L3 ANSWER 26 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2002:626738 CAPLUS  
 DOCUMENT NUMBER: 137:391001  
 TITLE: Two-photon induced modulation of optical properties in polymers for photonic applications  
 AUTHOR(S): Belfield, Kevin D.; Liu, Yong; Schafer, Katherine J.; Hernandez, Florencio E.  
 CORPORATE SOURCE: Department of Chemistry and School of Optics/CREOL, University of Central Florida, Orlando, FL, 32816-2366, USA  
 SOURCE: Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2002), 43(2), 503-504  
 CODEN: ACPPAY; ISSN: 0032-3934  
 PUBLISHER: American Chemical Society, Division of Polymer Chemistry  
 DOCUMENT TYPE: Journal; (computer optical disk)  
 LANGUAGE: English  
 AB The modulation of optical properties via photoacid generation (and subsequent protonation of a two-photon absorbing dye) and photochromism of a fulgide derivative is reported. The kinetic rate constant for the two-photon induced isomerization reaction of a fulgide was measured at two different intensities (two different powers), showing a quadratic dependence with respect to the pump intensity. The modulation of optical absorption and fluorescence properties were exploited in a polymeric medium where image formation via photoinduced fluorescence changes containing a two-photon absorbing fluorescent dye was demonstrated. Two-channel, two-photon fluorescence imaging provided both "pos." and "neg." image readout capability.  
 IT 421546-27-2  
 RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); FORM (Formation, nonpreparative); PROC (Process)  
 (two-photon induced modulation of optical properties in polymers for photonic applications)  
 RN 421546-27-2 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl-, conjugate monoacid (9CI) (CA INDEX NAME)



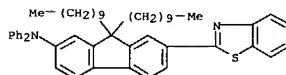
● H<sup>+</sup>  
 IT 262607-32-9

L3 ANSWER 27 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2002:72146 CAPLUS  
 DOCUMENT NUMBER: 137:270331  
 TITLE: A New Photosensitive Polymeric Material for WORM Optical Data Storage Using Multichannel Two-Photon Fluorescence Readout  
 AUTHOR(S): Belfield, Kevin D.; Schafer, Katherine J.  
 CORPORATE SOURCE: Department of Chemistry and School of Optics/CREOL, University of Central Florida, Orlando, FL, 32816-2366, USA  
 SOURCE: Chemistry of Materials (2002), 14(9), 3656-3662  
 CODEN: CMATEX; ISSN: 0897-4756  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Image formation is reported via photoinduced fluorescence changes in a polymeric medium with nondestructive two-photon fluorescence readout of a multilayer structure. A two-photon absorbing fluorescent dye possessing functional groups with differential basicity, (7-benzothiazolyl-9,9-didecyl-2,2-(N,N-diphenylamino)fluorene) (1), underwent protonation in the presence of a photoinduced acid generator upon exposure to a broadband UV light source or femtosecond near-IR laser irradiation. Solution studies demonstrated formation of monoprotonated and diprotonated species upon irradiation, each resulting in distinctly different absorption and fluorescence properties. The fluorescence of the original, neutral fluorophore was reduced upon monoprotonation, leading to a concomitant increase in fluorescence at longer wavelengths due to the monoprotonated form. Expts. in polymer films demonstrate the changes in fluorescence properties of the fluorophores can be employed for a write-once read-many (WORM) data storage medium with a two-photon fluorescence readout. Two-channel, two-photon fluorescence imaging provided both "pos." and "neg." image readout capability.  
 IT 421546-27-2 421546-28-3  
 RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); FORM (Formation, nonpreparative); PROC (Process)  
 (photosensitive polymeric material for optical data storage using multichannel two-photon fluorescence readout)  
 RN 421546-27-2 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl-, conjugate monoacid (9CI) (CA INDEX NAME)



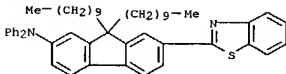
● H<sup>+</sup>  
 RN 421546-28-3 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl-, conjugate diacid (9CI) (CA INDEX NAME)

L3 ANSWER 26 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
 (two-photon induced modulation of optical properties in polymers for photonic applications)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 6 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RECORD.  
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L3 ANSWER 27 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
 (photosensitive polymeric material for optical data storage using multichannel two-photon fluorescence readout)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RECORD.  
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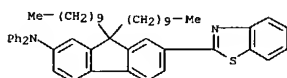


09/11/2004

10784312

L3 ANSWER 28 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN  
 ACCESSION NUMBER: 2002:542661 CAPLUS  
 DOCUMENT NUMBER: 137:360216  
 TITLE: Photophysical characterization of 2,9-bis(7-benzothiazole-9,9'-didecylfluoren-2-yl)perylene diimide: a new standard for steady-state fluorescence anisotropy  
 AUTHOR(S): Belfield, Kevin D.; Bondar, Mikhailo V.; Przhonska, Olga V.; Schafer, Katherine J.  
 CORPORATE SOURCE: Department of Chemistry and CREOL, University of Central Florida, School of Optics, Orlando, FL, 32816-2366, USA  
 SOURCE: Journal of Photochemistry and Photobiology, A: Chemistry (2002), 151(1-3), 7-11  
 CODEN: JPPCEJ; ISSN: 1010-6030  
 PUBLISHER: Elsevier Science B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The absorption, fluorescence excitation and emission spectra have been obtained in solution for 2,9-bis(7-benzothiazole-9,9'-didecylfluoren-2-yl)perylene diimide. Efficient resonance energy transfer from the fluorenyl group to the perylene ring center was observed. Interestingly, fluorescence emission was detected from the second excited electronic state of the perylene ring system. Fluorescence excitation anisotropy spectra obtained at room temperature exhibited a parallel orientation of the main absorption and emission band transition moments for the perylene-based dye in CH<sub>2</sub>Cl<sub>2</sub>. The value of excitation fluorescence anisotropy for the perylene dye in solution approached the theoretical maximum limit ( $r=0.4$ ), and indicated that the rotational correlation time exceeded the lifetime of the first excited state. These results provide the basis for using this unique compound as an anisotropy reference standard.  
 IT 280760-22-1  
 RL: PRP (Properties)  
 (photophys. characterization of perylene diimide derivative in relation to fluorescence anisotropy)  
 RN 280760-22-1 CAPLUS  
 CN Anthracene[2,1,9-def:6,5,10-d'e'f']diisoquinoline-1,3,8,10(2H,9H)-tetrone, 2,9-bis(7-(2-benzothiazolyl)-9,9-didecyl-9H-fluoren-2-yl)- (9CI) (CA INDEX NAME)

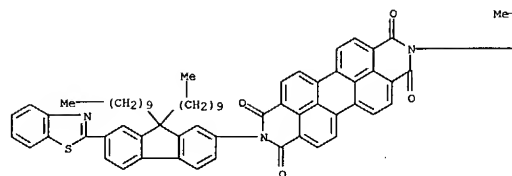
L3 ANSWER 29 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN  
 ACCESSION NUMBER: 2002:372749 CAPLUS  
 DOCUMENT NUMBER: 137:176417  
 TITLE: Spectral properties of several fluorene derivatives with potential as two-photon fluorescent dyes  
 AUTHOR(S): Belfield, K. D.; Bondar, M. V.; Przhonska, O. V.; Schafer, K. J.; Mourad, W.  
 CORPORATE SOURCE: Department of Chemistry and CREOL/School of Optics, University of Central Florida, Orlando, FL, 32816-2366, USA  
 SOURCE: Journal of Luminescence (2002), 97(2), 141-146  
 CODEN: JLMMA8; ISSN: 0022-2313  
 PUBLISHER: Elsevier Science B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Investigations of the absorption, steady-state fluorescence, excitation and excitation anisotropy properties of several fluorene derivs., (7-benzothiazol-2-yl)-9,9-didecylfluoren-2-yl-diphenylamine, 9,9-didecyl-2,7-bis-(N,N-diphenylamino)fluorene and (4-[2-(7-diphenylamino)-9,9-diethylfluoren-2-yl]vinyl)phenyl)phosphoric acid di-Et ester, in liquid solns. have been conducted. Spectral characteristics of these compds., including fluorescence quantum yields, were measured in acetonitrile, methylene chloride, THF and hexane at room temperature. Excitation anisotropy spectra provided a means to determine the nature of the short wavelength absorption bands as an electronic transition into a higher excited singlet state. It was found that excitation spectra in the short wavelength region do not correspond to the absorption bands that are correlated with the wavelength dependence of the fluorescence quantum yields. Major reasons of such spectral behavior are discussed.  
 IT 262607-32-9  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
 (UV-visible absorption, fluorescence, excitation anisotropy and excitation spectra of fluorene derivs. with potential as two-photon fluorescent dyes in solvents of varying polarity)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



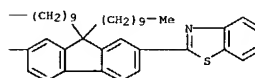
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L3 ANSWER 28 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN (Continued)

PAGE 1-A

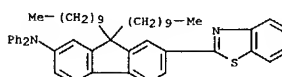


PAGE 1-B



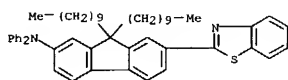
REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE  
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L3 ANSWER 30 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN  
 ACCESSION NUMBER: 2002:229713 CAPLUS  
 DOCUMENT NUMBER: 136:377354  
 TITLE: Modulation of optical properties in new photosensitive polymers: 3-D optical data storage media  
 AUTHOR(S): Belfield, Kevin D.; Schafer, Katherine J.  
 CORPORATE SOURCE: Dep. Chem. Sch. Optics/CREOL, Univ. Central Florida, Orlando, FL, 32816-2366, USA  
 SOURCE: Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2002), 43(1), 161-162  
 CODEN: ACPPAY; ISSN: 0032-3934  
 PUBLISHER: American Chemical Society, Division of Polymer Chemistry  
 DOCUMENT TYPE: Journal; (computer optical disk)  
 LANGUAGE: English  
 AB The results of the photoinduced protonation of fluorene dye in liquid solution and polymer thin films, and the subsequent 3-dimensional imaging of multilayer polymer films via 2-photon fluorescence imaging, resulting in write-once, read-many (WORM) optical data storage system, are presented. All solution studies were conducted in CH<sub>2</sub>Cl<sub>2</sub>. A 2-photon absorbing fluorescent dye possessing differentially basic functional groups underwent protonation in the presence of a photoinduced acid generator. Solution studies showed formation of discrete species upon irradiation, each leading to distinctly different spectroscopic properties. The modulation of optical absorption and fluorescence properties were exploited in a polymeric medium where image formation via photoinduced fluorescence changes containing a 2-photon absorbing fluorescent dye was shown. Two-channel, 2-photon fluorescence imaging provided both pos. and neg. image readout capability. The signal readout established the possibility for a binary optical data storage medium, where the intensities can be designated as a 0 and 1.  
 IT 262607-32-9  
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (modulation of optical properties in new 3-D optical data storage media of photosensitive polymers)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



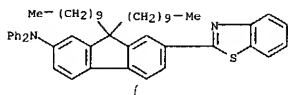
IT 421546-27-2 421546-28-3  
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
 (modulation of optical properties in new 3-D optical data storage

L3 ANSWER 30 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)  
 of photosensitive polymers)  
 RN 421546-27-2 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl-,  
 conjugate monoacid (9CI) (CA INDEX NAME)



● H<sup>+</sup>

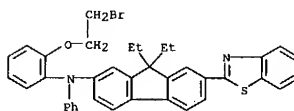
RN 421546-28-3 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl-,  
 conjugate diacid (9CI) (CA INDEX NAME)



● 2 H<sup>+</sup>

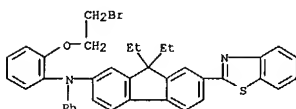
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L3 ANSWER 31 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2002:229669 CAPLUS  
 DOCUMENT NUMBER: 137:20727  
 TITLE: Synthesis and optical characterization of  
 1H-pyrazole-based 6F-benzoxazole polymers  
 incorporating a two-photon absorption chromophore  
 AUTHOR(S): Dang, T. D.; Matuszewski, M. J.; Dalton, M. J.;  
 Kannan, R.; Franklin, J. E.; Durstock, M. F.; Tan, L.  
 S.; Arnold, F. E.  
 CORPORATE SOURCE: Polymer Branch, AFRL/MLBP, Wright-Patterson Air Force  
 Base, Dayton, OH, 45433, USA  
 SOURCE: Polymer Preprints (American Chemical Society,  
 Division of Polymer Chemistry) (2002), 43(1), 102-103  
 CODEN: ACPAY; ISSN: 0032-3934  
 PUBLISHER: American Chemical Society, Division of Polymer  
 Chemistry  
 DOCUMENT TYPE: Journal; (computer optical disk)  
 LANGUAGE: English  
 AB A homopolymer and a copolymer of 1H-pyrazole-based 6F-benzoxazole  
 incorporating a diphenylaminofluorene-based chromophore with high  
 two-photon absorption cross-section was synthesized via a post-polymer  
 deprotonation-alkylation step. Thermal characterization of the  
 polymer-bound chromophore indicated a substantial lowering of the polymer  
 T<sub>g</sub> due to the side-chain chromophore structural unit on the polymer  
 backbone. The electronic absorption of the polymer, polymer-bound  
 chromophore, and the pristine chromophore in THF solution and in the  
 solid state was studied. The UV absorption stability of the chromophore and  
 the polymer-bound chromophore films in nitrogen and in air was also studied.  
 IT 433971-77-8P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (chromophore, AF-343; preparation and UV absorption stability of  
 1H-pyrazole-hexafluorobenzoxazole functionalized with two-photon  
 absorption diphenylaminofluorene chromophore)  
 RN 433971-77-8 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-N-[2-(2-bromoethoxy)phenyl]-9,9-  
 diethyl-N-phenyl- (9CI) (CA INDEX NAME)

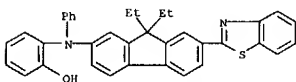


IT 433971-77-8DP, reaction products with pyrazole-  
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 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (chromophore-functionalized; preparation and UV absorption stability  
 of

L3 ANSWER 31 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)  
 1H-pyrazole-hexafluorobenzoxazole functionalized with two-photon  
 absorption diphenylaminofluorene chromophore)  
 RN 433971-77-8 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-N-[2-(2-bromoethoxy)phenyl]-9,9-  
 diethyl-N-phenyl- (9CI) (CA INDEX NAME)

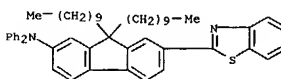


IT 433971-76-7  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (preparation and UV absorption stability of 1H-pyrazole-  
 hexafluorobenzoxazole functionalized with two-photon absorption  
 diphenylaminofluorene chromophore)  
 RN 433971-76-7 CAPLUS  
 CN Phenol,  
 2-[1-(7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl)phenylamino]-  
 (9CI) (CA INDEX NAME)



REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS  
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L3 ANSWER 32 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2002:20504 CAPLUS  
 DOCUMENT NUMBER: 137:85870  
 TITLE: Three-dimensional two-photon imaging in polymeric  
 materials  
 AUTHOR(S): Belfield, Kevin D.; Schafer, Katherine J.; Andrasik,  
 Stephen; Yavuz, Ozlem; Van Stryland, Eric W.; Hagan,  
 David J.; Hales, Joel M.  
 CORPORATE SOURCE: Department of Chemistry, University of Central  
 Florida, Orlando, FL, 32816-2366, USA  
 SOURCE: Proceedings of SPIE-The International Society for  
 Optical Engineering (2002), 4459(Photorefractive  
 Fiber  
 and Crystal Devices: Materials, Optical Properties,  
 and Applications VII, and Optical Data Storage),  
 281-289  
 CODEN: PSISDG; ISSN: 0277-786X  
 PUBLISHER: SPIE-The International Society for Optical  
 Engineering  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The authors report image formation via single and two-photon photoinduced  
 fluorescence changes in a polymeric medium with two-photon fluorescence  
 read-out of multilayer structures. Photoinduced acid generation in the  
 presence of a two-photon fluorescent dye possessing strongly basic  
 functional groups 7-benzothiazolyl-9,9-didecyl-2,2-(N,N-  
 diphenylamino)fluorene underwent protonation upon exposure with UV or  
 near-IR (740 nm fs pulses). Solution studies demonstrate formation of  
 monoprotonated and diprotonated species upon irradiation, each resulting  
 in distinctly different absorption and fluorescence properties. The  
 fluorescence of the original, neutral, fluorophore is quenched upon  
 monoprotonation with a concomitant increase in fluorescence at longer  
 wavelengths due to the monoprotonated form. Hence, two channel  
 two-photon fluorescence imaging provides 'pos.' or 'neg.' image readout capability.  
 Results of solution and solid polymer thin films expts. are presented.  
 IT 421546-27-2 421546-28-3  
 RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical  
 process); PRP (Properties); FORM (Formation, nonpreparative); PROC  
 (Process)  
 (protonation of two-photon absorbing fluorescent dye and its  
 application for 3D imaging in polymeric film containing onium salt  
 photoacid generator)  
 RN 421546-27-2 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl-,  
 conjugate monoacid (9CI) (CA INDEX NAME)



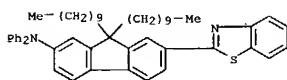
● H<sup>+</sup>

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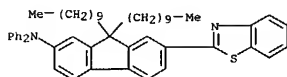
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L3 ANSWER 32 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN (Continued)

RN 421546-28-3 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl-,  
 conjugate diacid (9CI) (CA INDEX NAME)

● 2 H<sup>+</sup>

IT 262607-32-9  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
 PROC (Process)  
 (protonation of two-photon absorbing fluorescent dye and its  
 application for 3D imaging in polymeric film containing onium salt  
 photoacid generator)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI)  
 (CA INDEX NAME)



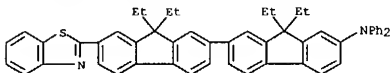
REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR  
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L3 ANSWER 33 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN  
 ACCESSION NUMBER: 2001:923862 CAPLUS  
 DOCUMENT NUMBER: 136:54238  
 TITLE: Multiphoton photosensitization system  
 INVENTOR(S): Devoe, Robert J.  
 PATENT ASSIGNEE(S): 3M Innovative Properties Company, USA  
 SOURCE: PCT Int. Appl., 66 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

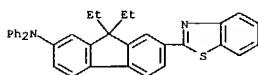
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001096409	A2	20011220	WO 2001-US19164	20010614
WO 2001096409	A3	20020404		
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EP 1297021	A2	20030402	EP 2001-946384	20010614
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WO 2001-US19164 W 20010614				

OTHER SOURCE(S): MARPAT 136:54238  
 AB A method of multiphoton photosensitizing a photoreactive composition comprises irradiating the composition with light sufficient to cause simultaneous absorption of at least two photons, thereby inducing at least one acid- or radical-initiated chemical reaction where the composition is exposed to the light. The composition comprises: (a) at least one reactive species that is capable of undergoing such reaction; and (b) at least one multi-component, multiphoton photoinitiator system.  
 IT 219998-27-3 222617-85-8 262607-32-9  
 287493-05-4 287493-07-6 287493-08-7  
 RL: CAT (Catalyst use); USES (Uses)  
 (multiphoton photosensitization system)  
 RN 219998-27-3 CAPLUS  
 CN [2,2'-Bi-9H-fluoren]-7-amine, 7'-(2-benzothiazolyl)-9,9,9',9'-tetraethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

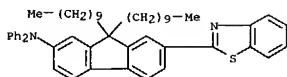
L3 ANSWER 33 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN (Continued)



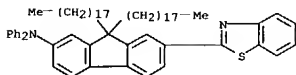
RN 222617-85-8 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl-N,N-diphenyl- (9CI)  
 (CA INDEX NAME)



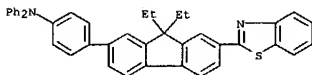
RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI)  
 (CA INDEX NAME)



RN 287493-05-4 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-dioctadecyl-N,N-diphenyl- (9CI)  
 (CA INDEX NAME)

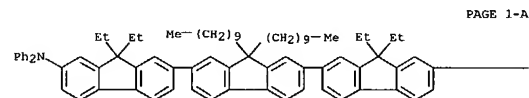


RN 287493-07-6 CAPLUS  
 CN Benzenamine, 4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-N,N-diphenyl- (9CI) (CA INDEX NAME)

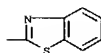


RN 287493-08-7 CAPLUS  
 CN [2,2':7',2''-Ter-9H-fluoren]-7-amine, 7'-(2-benzothiazolyl)-9',9''-didecyl-9,9,9'',9''-tetraethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

L3 ANSWER 33 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN (Continued)



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L3 ANSWER 34 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2001:744647 CAPLUS  
 DOCUMENT NUMBER: 135:290148  
 TITLE: Multi-armed chromophores with very large two-photon absorption cross-sections  
 INVENTOR(S): Kannan, Ramamurthi; Reinhardt, Bruce A.; Tan, Loon-seng  
 PATENT ASSIGNEE(S): United States of America as Represented by the Secretary of the Air Force, USA  
 SOURCE: U.S., 10 pp.  
 CODEN: USXXKM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6300502	B1	20011009	US 2000-731549	20001208
PRIORITY APPLN. INFO.:			US 2000-731549	20001208

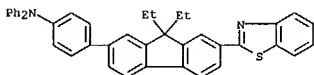
OTHER SOURCE(S): MARPAT 135:290148  
 AB Provided are chromophores with very large two-photon absorption cross-sections. One group of these chromophores has the formula (TQ)nPhm wherein Q is a single bond or 1,4-phenylene, n is 1-3, m is 3-n, and T is 9,9-dialkyl-7-(2-benzothiazolyl)-2-fluorenyl, provided that when Q is a single bond, the value of n is 2 or 3. Another group of these chromophores has the formula (TQ)nGPhm wherein T is as defined above, Q is as defined above, n is 1-4, m is 4-n, and G is a 4-arm core unit. Yet another group of these chromophores has the formula: (TQ)nXPhm wherein T is as described previously, Q is as defined above, n is 1-6, m is 6-n, and

X is a 6-arm core unit. The production of these laser dyes was exemplified.

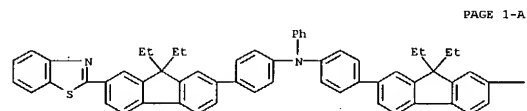
IT 287493-07-6P  
 RL: IMF (Industrial manufacture); PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(dye; production of multi-armed dyes with very large two-photon absorption cross sections)

RN 287493-07-6 CAPLUS  
 CN Benzenamine, 4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-N,N-diphenyl- (9CI) (CA INDEX NAME)



L3 ANSWER 34 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)  
 RN 364635-66-5 CAPLUS  
 CN Benzenamine, 4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-N-[4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]phenyl]-N-phenyl- (9CI) (CA INDEX NAME)

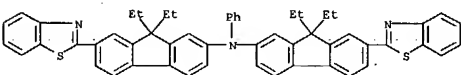


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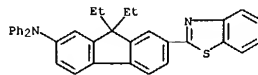


RN 364635-67-6 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-N-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-9,9-diethyl-N-phenyl- (9CI) (CA INDEX NAME)

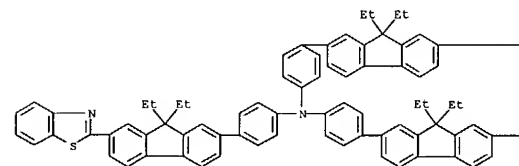


RN 364635-72-3 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-N,N-bis[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-9,9-diethyl- (9CI) (CA INDEX NAME)

L3 ANSWER 34 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)  
 IT 222617-85-8P 267667-11-8P 364635-66-5P  
 364635-67-6P 364635-72-3P  
 RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (dye; production of multi-armed dyes with very large two-photon absorption cross sections)  
 RN 222617-85-8 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

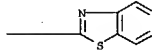
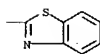


RN 267667-11-8 CAPLUS  
 CN Benzenamine, 4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-N,N-bis[4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]phenyl]- (9CI) (CA INDEX NAME)

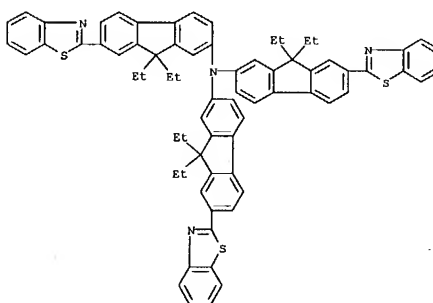


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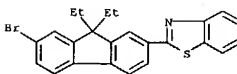
L3 ANSWER 34 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)



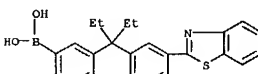
IT 225113-41-7P 287493-09-8P 340300-53-0P  
 364635-65-4P 364635-69-8P 364635-70-1P  
 364635-71-2P  
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(intermediate; production of multi-armed dyes with very large two-photon absorption cross sections)

RN 225113-41-7 CAPLUS  
 CN Benzothiazole, 2-(7-bromo-9,9-diethyl-9H-fluoren-2-yl)- (9CI) (CA INDEX NAME)



RN 287493-09-8 CAPLUS  
 CN Boronic acid, [7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]- (9CI) (CA INDEX NAME)

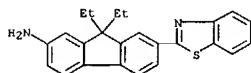


RN 340300-53-0 CAPLUS

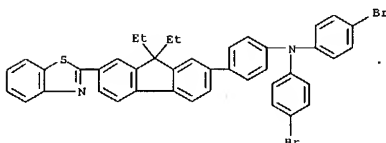
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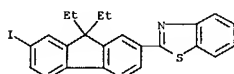
L3 ANSWER 34 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)  
CN 9H-fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl- (9CI) (CA INDEX NAME)



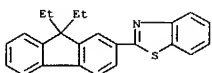
RN 364635-65-4 CAPLUS  
CN Benzenamine, 4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-N,N-bis(4-bromophenyl)- (9CI) (CA INDEX NAME)



RN 364635-69-8 CAPLUS  
CN Benzothiazole, 2-(9,9-diethyl-7-iodo-9H-fluoren-2-yl)- (9CI) (CA INDEX NAME)

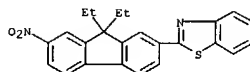


RN 364635-70-1 CAPLUS  
CN Benzothiazole, 2-(9,9-diethyl-9H-fluoren-2-yl)- (9CI) (CA INDEX NAME)



RN 364635-71-2 CAPLUS  
CN Benzothiazole, 2-(9,9-diethyl-7-nitro-9H-fluoren-2-yl)- (9CI) (CA INDEX NAME)

L3 ANSWER 34 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)



REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE  
FORMAT

L3 ANSWER 35 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 2001:380926 CAPLUS  
DOCUMENT NUMBER: 134:374112  
TITLE: Three dimensional data storage device and method for reading  
INVENTOR(S): Prasad, Paras N.; Pudavar, Haridas E.  
PATENT ASSIGNEE(S): The Research Foundation of State University of New York, USA  
SOURCE: PCT Int. Appl., 61 pp.  
DOCUMENT TYPE: CODEN: PIXXD2  
LANGUAGE: Patent  
FAMILY ACC. NUM. COUNT: English  
PATENT INFORMATION: 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001037266	A1	20010525	WO 2000-US31666	20001117
W: AK, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, T2, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CH, GA, GN, GW, ML, MR, NE, SN, TD, TG				
PRIORITY APPLN. INFO.:			US 1999-165953P	P 19991117

AB A method for reading a three-dimensional data storage device includes: a) providing a data storage medium constituting a three-dimensional matrix and a plurality of dye mols. dispersed therein, wherein the dye mols. are capable of a fluorescence change induced by multiple-photon excitation;

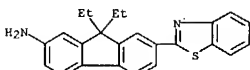
b) inducing a fluorescence change of the dye by multiple-photon excitation under conditions effective to write an information code in a selected portion of the medium; c) inducing one-photon excitation in the fluorescence-changed dye; d) detecting a fluorescence emission in the one-photon excited dye portion; and e) correlating the fluorescence with the dye mols. contained in the selected portion that are detectably altered effective to retrieve the information code. The process can be repeated to write multiple layers of information. The data storage methods and media are particularly useful for storing or archiving a series of three-dimensional images or information in the form of bar codes, medical bracelets, and identification tags. Methods for reading data stored in the data storage media using confocal microscopy are also disclosed.

IT 340300-53-0

RL: DEV (Device component use); USES (Uses)  
(multi-photon absorbing dye in three dimensional matrix of data storage material)

RN 340300-53-0 CAPLUS  
CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl- (9CI) (CA INDEX NAME)

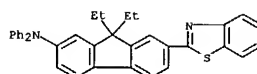
L3 ANSWER 35 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)



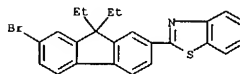
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE  
FORMAT

L3 ANSWER 36 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN  
 ACCESSION NUMBER: 2001:298453 CAPLUS  
 DOCUMENT NUMBER: 135:93912  
 TITLE: Diphenylaminofluorene-Based Two-Photon-Absorbing Chromophores with Various  $\pi$ -Electron Acceptors  
 AUTHOR(S): Kannan, Ramamurthi; He, Guang S.; Yuan, Lixiang; Xu, Faming; Prasad, Paras N.; Dombroskie, Ann G.; Reinhardt, Bruce A.; Baur, Jeffery W.; Vaia, Richard A.; Tan, Loon-Seng  
 CORPORATE SOURCE: Systran Systems Corporation, Dayton, OH, 45432, USA  
 SOURCE: Chemistry of Materials (2001), 13(5), 1896-1904  
 CODEN: CMATEX; ISSN: 0897-4756  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB A new series of linear, asym. (diphenylamino)fluorene-based chromophores (AFX) with various strong  $\pi$ -electron acceptors were synthesized and evaluated for two-photon absorptivity. These chromophores were studied to determine a suitable replacement for 2-(4-pyridinyl)vinyl, the  $\pi$  acceptor for our previously reported AFX series, which contains a photochem. and thermooxidatively unstable olefinic unit. In addition to the benzoyl group (AF-370), these  $\pi$ -electron acceptors include 2-benzothiazolyl (AF-240), 2-benzoxazolyl (AF-390), N-phenyl-2-benzimidazolyl (AF-386), and 3,4-diphenyl-1H-imidazol-2-yl (AF-385) moieties (five-membered heterocycles) and the 2-quinoxaliny (AF-260) group (six-membered heterocycle). From nanosecond nonlinear transmission measurements, these new chromophores have effective two-photon cross sections ( $\sigma_2'$ ) at 800 nm spanning from  $3.87 \times 10^{-48}$  cm<sup>4</sup> s/(photon mol.) for AF-385 to  $97.46 \times 10^{-48}$  cm<sup>4</sup> s/(photon mol.) for AF-240. Two of them, AF-240 and AF-370 [ $\sigma_2' = 84.32 \times 10^{-48}$  cm<sup>4</sup> s/(photon mol.)], stand out as having relatively good, albeit lower, values of two-photon cross sections, as compared to that of previously reported N,N-diphenyl-7-[2-(4-pyridinyl)ethenyl]-9,9-didecyl-2-fluorenamine (AF-50) [ $\sigma_2' = 115.6 \times 10^{-48}$  cm<sup>4</sup> s/(photon mol.)]. However, we observed that AF-240 was more photochem. robust than AF-50 when their THF solns. were subjected to repetitive and prolonged exposure to nanosecond laser radiation. On the basis of nanosecond TPA cross-section data ( $\sigma_2'$ /mol. weight values), the general trend for  $\pi$ -electron accepting ability, i.e., ability to accept charge transferred from diphenylamine, appears to be as follows: 2-(4-pyridinyl)vinyl > 2-benzothiazolyl > benzoyl > N-phenyl-2-benzimidazolyl > 2-quinoxaliny > 2-benzoxazolyl > 4,5-diphenyl-2-imidazolyl.  
 IT 222617-85-EP, AF 240  
 RI: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (preparation of (diphenylamino)fluorene-based two-photon-absorbing chromophores with various  $\pi$ -electron acceptors)  
 RN 222617-85-8 CAPLUS  
 CN 9H-Fluorene-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

L3 ANSWER 36 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN (Continued)



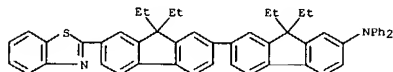
IT 225113-41-7P  
 RI: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (preparation of (diphenylamino)fluorene-based two-photon-absorbing chromophores with various  $\pi$ -electron acceptors)  
 RN 225113-41-7 CAPLUS  
 CN Benzothiazole, 2-(7-bromo-9,9-diethyl-9H-fluorene-2-yl)- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 54 THERE ARE 54 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE  
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L3 ANSWER 37 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN  
 ACCESSION NUMBER: 2001:19249 CAPLUS  
 DOCUMENT NUMBER: 135:211388  
 TITLE: Two-photon absorption induced photopolymerization  
 AUTHOR(S): Denny, Lisa R.; Baur, Jeffery W.; Alexander, Max D., Jr.; Kannan, Ramamurthi; Kirkpatrick, Sean M.; Clarson, Stephen J.  
 CORPORATE SOURCE: Air Force Research Laboratory (AFRL), AFRL/MLBP, Wright Patterson Air Force Base, OH, 45433-7750, USA  
 SOURCE: International SAMPE Technical Conference (2000), 32, 712-716  
 CODEN: ISTCEF; ISSN: 0892-2624  
 PUBLISHER: Society for the Advancement of Material and Process Engineering  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Organic two-photon chromophores undergo a process called two-photon absorption in which light is absorbed in the IR wavelength range, which in turn can initiate photochem. using either the two-photon excited mol. or its up-converted fluorescence emission. One type of photochem. for which the two-photon up-conversion can be used is photopolymn. Organic/polymeric materials often exhibit non-resonant linear absorption in the UV wavelength range, while in near IR (NIR) wavelengths little or no absorption is observed. As a result NIR light can penetrate much deeper into the organic materials to initiate photocuring throughout the resin. Thus, using this NIR photocure technique, it is possible to photocure objects thicker than those fabricated with traditional UV curing. Novel two-photon organic chromophores developed in the Air Force Research Laboratory (AFRL) and by other research groups exhibit large effective two-photon cross-section values, which provide efficient excited mol. states or localized UV/visible fluorescence required for photocure. The utilization of up-conversion photochem. processing provides a relatively new processing method for fabrication of structures ranging from precisely patterned nanostructures to thick structures (>1cm). This research evaluates the advantages and limitations of this new polymer processing technique and the critical factors influencing the reaction.  
 IT 219998-27-3, AF 250  
 RI: CAT (Catalyst use); USES (Uses) (chromophore; two-photon absorption induced photopolymn.)  
 RN 219998-27-3 CAPLUS  
 CN [2,2'-Bi-9H-fluorene]-7-amine, 7'-(2-benzothiazolyl)-9,9,9',9'-tetraethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

L3 ANSWER 37 OF 49 CAPLUS COPYRIGHT 2004 ACS ON STN (Continued)



REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE  
 FORMAT

L3 ANSWER 38 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:548729 CAPLUS  
 DOCUMENT NUMBER: 133:151989  
 TITLE: Benzothiazole-containing two-photon chromophores exhibiting strong frequency upconversion  
 INVENTOR(S): Reinhardt, Bruce A.; Kannan, Ramamurthi  
 PATENT ASSIGNEE(S): United States Dept. of the Air Force, USA  
 SOURCE: U.S., 9 pp.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

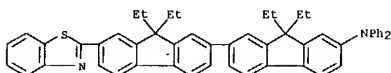
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6100405	A	20000808	US 1999-333304	19990615
PRIORITY APPLN. INFO.:			US 1999-127602P	P 19990316

OTHER SOURCE(S): MARPAT 133:151989

AB There are provided asym. two-photon-absorbing chromophores having large two-photon-absorbing cross sections and improved thermal and photochem. stability, of formula DArA wherein Ar is arenediyl, including fluorenediyl; D is diarylamino; and A is selected from the group benzothiazolyl or benzoxazolyl optionally attached through an E-ethenediyl linkage. Thus, 9,9-diethyl-7-(diphenylamino)-2-(2-benzothiazolyl)fluorene was prepared from 7-bromo-9,9-diethyl-2-fluorenealdehyde by way of successive treatment with 2-aminothiophenol and diphenylamine.

IT 219998-27-3P 222617-85-8P 262607-32-9P  
 287493-05-4P 287493-07-6P 287493-08-7P  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (fluorescent dye; production of two-photon chromophores with improved heat and light stability)

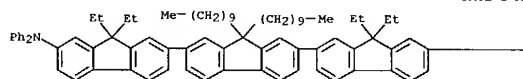
RN 219998-27-3 CAPLUS  
 CN [2,2'-bi-9H-fluoren]-7-amine, 7'-(2-benzothiazolyl)-9,9,9',9'-tetraethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



RN 222617-85-8 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

L3 ANSWER 38 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)

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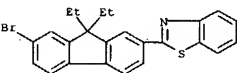


PAGE 1-B

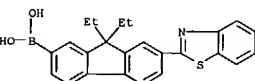


IT 225113-41-7P 287493-09-8P 287493-17-8P  
 287493-18-9P  
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation);  
 RACT (Reactant or reagent)  
 (intermediate; production of two-photon chromophores with improved heat and light stability)

RN 225113-41-7 CAPLUS  
 CN Benzothiazole, 2-(7-bromo-9,9-diethyl-9H-fluoren-2-yl)- (9CI) (CA INDEX NAME)

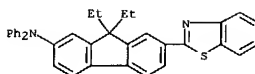


RN 287493-09-8 CAPLUS  
 CN Boronic acid, [7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]- (9CI) (CA INDEX NAME)

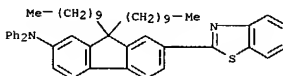


RN 287493-17-8 CAPLUS  
 CN Benzothiazole, 2-[9,9-diethyl-7-(tributylstannyl)-9H-fluoren-2-yl]- (9CI) (CA INDEX NAME)

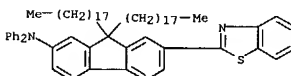
L3 ANSWER 38 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)



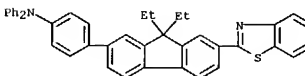
RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



RN 287493-05-4 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

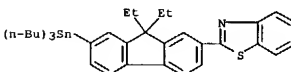


RN 287493-07-6 CAPLUS  
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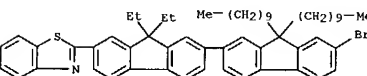


RN 287493-08-7 CAPLUS  
 CN [2,2':7',2''-ter-9H-fluoren]-7-amine, 7''-(2-benzothiazolyl)-9,9'-didecyl-9,9,9'',9'''-tetraethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

L3 ANSWER 38 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)



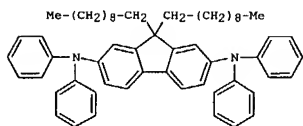
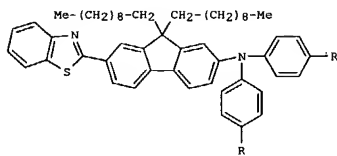
RN 287493-18-9 CAPLUS  
 CN Benzenamine, 4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-N,N-diphenyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE

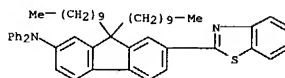
FORMAT

L3 ANSWER 39 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2000:425868 CAPLUS  
 DOCUMENT NUMBER: 133:207653  
 TITLE: Synthesis of new two-photon absorbing fluorene derivatives via Cu-mediated Ullmann condensations  
 AUTHOR(S): Belfield, Kevin D.; Schafer, Katherine J.; Mourad, Wael; Reinhardt, Bruce A.  
 CORPORATE SOURCE: Department of Chemistry, University of Central Florida, Orlando, FL, 32816-2366, USA  
 SOURCE: Journal of Organic Chemistry (2000), 65(15), 4475-4481  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 133:207653  
 GI

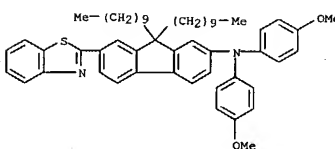


AB The Ullmann amination reaction was utilized to provide access to a number of fluorene analogs from common intermediates, via facile functionalization at positions 2, 7, and 9 of the fluorene ring. Through variation of amine or iodo fluorene derivative, analogs bearing substituents with varying electron-donating and electron-withdrawing ability, e.g., diphenylamino, bis-(4-methoxyphenyl)amine, nitro, and benzothiazole, were synthesized in good yield. The novel fluorene derivs. were fully characterized, including absorption and emission spectra. Didecyl at the 9-position afforded remarkably soluble derivs. Target compds. I (R = H, MeO) and II are

L3 ANSWER 39 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)  
 potentially useful as fluorophores in two-photon fluorescence microscopy. Their UV-vis spectra display desirable absorption in the range of interest suitable for two-photon excitation by near-IR femtosecond lasers. Preliminary measurements of two-photon absorption indicate the derivs. exhibit high two-photon absorptivity, affirming their potential as two-photon fluorophores. For example, using a 1210 nm femtosecond pump beam, (diphenylamino)benzothiazolylfluorene I (R = H) exhibited nondegenerate two-photon absorption, with two-photon absorptivity (S) of ca. 820 + 10-50 cm<sup>4</sup> s photon<sup>-1</sup> mol<sup>-1</sup> at the femtosecond white light continuum probe wavelength of 615 nm.  
 IT 262607-32-9P 289892-09-7P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (preparation of fluorene derivs. as two-photon fluorophores for fluorescence microscopy via copper-mediated Ullmann aminations)  
 RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

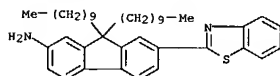


RN 289892-09-7 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-bis(4-methoxyphenyl)- (9CI) (CA INDEX NAME)

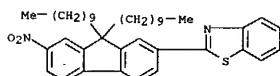


IT 262607-30-7P 262607-33-0P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (preparation of fluorene derivs. as two-photon fluorophores for fluorescence microscopy via copper-mediated Ullmann aminations)  
 RN 262607-30-7 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl- (9CI) (CA INDEX NAME)

L3 ANSWER 39 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)



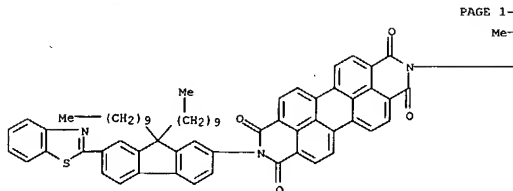
RN 262607-33-0 CAPLUS  
 CN Benzothiazole, 2-(9,9-didecyl-7-nitro-9H-fluoren-2-yl)- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE

FORMAT

L3 ANSWER 40 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2000:312491 CAPLUS  
 DOCUMENT NUMBER: 133:90722  
 TITLE: Synthesis and characterization of a perylene-based luminescent organic glass  
 AUTHOR(S): Belfield, Kevin D.; Schafer, Katherine J.; Alexander, Max D. Jr.  
 CORPORATE SOURCE: Department of Chemistry, University of Central Florida, Orlando, FL, 32816-2366, USA  
 SOURCE: Chemistry of Materials (2000), 12(5), 1184-1186  
 CODEN: CMATEX; TSN: 0897-4756  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The red dye N,N'-bis[7-(2-benzothiazolyl)-9,9-didecyl-2-fluorenyl]perylenetetracarboxylic diimide (I) was prepared from perylenetetracarboxylic dianhydride and 7-(2-benzothiazolyl)-9,9-didecyl-2-fluorenylamine. Photoluminescence studies of I showed that it underwent intramolecular energy transfer from the fluorenyl moiety to the perylene ring system upon excitation with long-wavelength UV light. I should provide broad band 2-photon absorption in the ranges of 600-770 and 820-1090 nm. I had no clear melting or crystallization transitions, while showing approx. 4% weight loss at 380°. Good solubility was noted in common organic solvents.  
 IT 280768-22-1P  
 RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (preparation and characterization of perylene-based luminescent organic glass)  
 RN 280768-22-1 CAPLUS  
 CN Anthra[2,1,9-def:6,3,10-d'e'f']diisoquinoline-1,3,8,10(2H,9H)-tetrone, 2,9-bis[7-(2-benzothiazolyl)-9,9-didecyl-9H-fluoren-2-yl]- (9CI) (CA INDEX NAME)

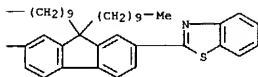


PAGE 1-A

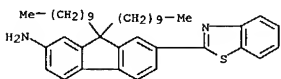


L3 ANSWER 40 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)

PAGE 1-B



IT 262607-30-7, 7-(2-Benzothiazolyl)-9,9-didecyl-2-fluorenylamine  
 RL: RCT (Reactant); PACT (Reactant or reagent)  
 (starting material; preparation and characterization of perylene-based  
 luminescent organic glass)  
 RN 262607-30-7 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl- (9CI) (CA INDEX  
 NAME)



REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR  
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 RECORD. ALL CITATIONS AVAILABLE IN THE RE  
 FORMAT

L3 ANSWER 41 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:265904 CAPLUS

DOCUMENT NUMBER: 132:340824

TITLE:

Two-photon Excitation and Optical Spatial-Profile

Reshaping via a Nonlinear Absorbing Medium

He, Guang S.; Swiatkiewicz, Jacek; Jiang, Yan;

Prasad, Paras N.; Reinhardt, Bruce A.; Tan, Loon-Seng;

Kannan,

CORPORATE SOURCE:

Ramamurthi  
Photonics Research Laboratory Department of

Chemistry,

State University of New York at Buffalo, Buffalo, NY,  
14260-3000, USA

JOURNAL OF PHYSICAL CHEMISTRY A (2000), 104(20),

4805-4810

CODEN: JPCAFH; ISSN: 1089-5639

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Two-photon processes have recently received considerable attention, as they offer opportunities for both fundamental research and technol. applications. The authors illustrate both of these opportunities by reporting on a study of 2-photon properties and discussing a specific application of a new chromophore, tris[4-(7-benzothiazol-2-yl)-9,9-diethylfluoren-2-yl]phenylamine (AF-350). This new compound exhibits a large 2-photon absorptive cross section and, more importantly from the application point of view, a high photochem./photothermal stability. The nonlinear optical properties of an AF-350 solution were studied with .apprx 800-nm laser pulses in both nanosecond and femtosecond regimes. The 2-photon excited fluorescence spectrum and temporal behavior were compared with the corresponding results obtained for 1-photon excitation. There is an .apprx 11-ps delay between an ultrashort pump pulse and the 1st peak of the 2-photon induced fluorescence signal, whereas no delay

was measured between the pump pulse and the 1st peak of the 1-photon induced fluorescence. The measured effective 2-photon absorption (TPA) cross section is  $\sigma_2 = (151 \pm 23) + 10^{-20} \text{ cm}^4/\text{GW}$  for 7-ns, 810-nm laser pulses and  $\sigma_2 = (0.61 \pm 0.02) + 10^{-20} \text{ cm}^4/\text{GW}$  for 135-fs, 796-nm laser pulses. One specific application reported here is the spatial-profile reshaping and smoothing of a focused laser field.

IT 267667-11-8

RL: PRP (Properties)

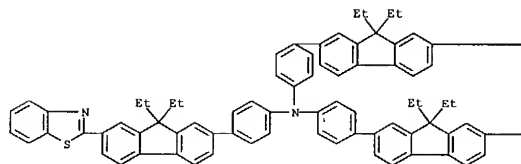
(two-photon excitation and optical spatial-profile reshaping via nonlinear absorbing medium)

RN 267667-11-8 CAPLUS

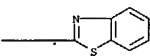
CN Benzenamine, 4-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-N,N-bis[4-(7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl)phenyl]- (9CI)  
 (CA INDEX NAME)

L3 ANSWER 41 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)

PAGE 1-A



PAGE 1-B



REFERENCE COUNT: 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR  
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 RECORD. ALL CITATIONS AVAILABLE IN THE RE  
 FORMAT

L3 ANSWER 42 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:208008 CAPLUS

DOCUMENT NUMBER: 132:334971

TITLE:

Two-photon up-converted fluorescence facilitated

photopolymerization

Denny, Lisa R.; Baur, Jeffery W.; Alexander, Max D., Jr.; Kirkpatrick, Sean M.; Carlson, Stephen J.

CORPORATE SOURCE: Air Force Research Laboratory (AFRL), AFRL/MLBP,

Wright Patterson Air Force Base, OH, 45433-7750, USA

SOURCE: Polymer Preprints (American Chemical Society,

Division of Polymer Chemistry) (2000), 41(1), 3

CODEN: ACPPAY; ISSN: 0032-3934

PUBLISHER: American Chemical Society, Division of Polymer

Chemistry

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Several resin blends of 2 different two-photon chromophores were tested; these generate visible light at 475 nm, which in turn activates a photoinitiator to start the polymerization reaction. Pos. results were obtained

for 0.4% of a heteroarom.-substituted amine chromophore (AF380) in

NOA-72, a com. available UV/VIS cure optical adhesive resin containing photoinitiators. Excitation was carried out with an IR laser, and the extent of polymerization in the path of the beam was studied.

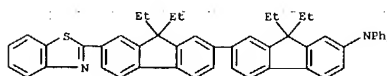
IT 219998-27-3, AF 250

RL: CAT (Catalyst use); USES (Uses)

(photopolym. facilitated by two-photon fluorescence chromophores as photoinitiator activators)

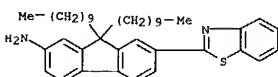
RN 219998-27-3 CAPLUS

CN [2,2'-Bi-9H-fluoren]-7-amine, 7'-(2-benzothiazolyl)-9,9,9'-tetraethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



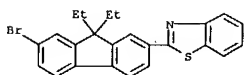
REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE  
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L3 ANSWER 43 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2000:36371 CAPLUS  
 DOCUMENT NUMBER: 132:257698  
 TITLE: Nonlinear spectrometer for characterization of organic and polymeric molecules  
 AUTHOR(S): Negres, Raluca A.; Van Stryland, Eric W.; Hagan, David  
 J.; Belfield, Kevin D.; Schafer, Katherine J.; Przhonska, Olga V.; Reinhardt, Bruce A.  
 CORPORATE SOURCE: Sch. Optics, CREOL/Univ. of Central Florida, Orlando, FL, USA  
 SOURCE: Proceedings of SPIE-The International Society for Optical Engineering (1999), 3796(Organic Nonlinear Optical Materials), 88-97  
 CODEN: PSISDG; ISSN: 0277-786X  
 PUBLISHER: SPIE-The International Society for Optical Engineering  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The authors have developed a femtosecond continuum spectrometer to measure nonlinear absorption spectra from 300 nm in the UV to 1.7 µm in the IR. This method is applied for measuring NLA spectra of semiconductor, organic and polymeric materials. The pump-probe nature of the experiment also allows the temporal response to be determined, thus helping in the determining of the underlying phys. mechanisms for the nonlinearity. The authors describe studies of two-photon absorption in alkyl fluorenes and excited state absorption dynamics in polymethines using this spectrometer.  
 IT 262607-30-7P 262607-32-9P 262607-33-0P  
 RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (nonlinear spectrometer for characterization of organic and polymeric mols.)  
 RN 262607-30-7 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl- (9CI) (CA INDEX NAME)

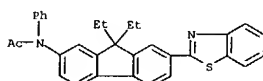


RN 262607-32-9 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-didecyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

L3 ANSWER 44 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 1999:211109 CAPLUS  
 DOCUMENT NUMBER: 130:352688  
 TITLE: Synthesis and characterization of new two-photon absorbing polymers  
 AUTHOR(S): Belfield, Kevin D.; Reinhardt, Bruce A.; Brott, Lawrence L.; Clarson, Stephen J.; Najjar, Ousama; Plus, Silvester M.; Van Stryland, Eric W.; Negres, Raluca  
 CORPORATE SOURCE: Department of Chemistry, Department of Mechanical, Materials & Aerospace Engineering & School of Optics, University of Central Florida, Orlando, FL, 32816, USA  
 SOURCE: Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (1999), 40(1), 127-128  
 CODEN: ACPRAY; ISSN: 0032-3934  
 PUBLISHER: American Chemical Society, Division of Polymer Chemistry  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB 2-Benzothiazoyl-7-(N-vinylbiphenyl-N-phenylamino) derivative monomer was prepared from 2,7-dibromo-9,9-diethylfluorene and copolyd. with styrene to give a copolymer. Fluorenyl-containing polysiloxanes with low glass temperature were prepared by hydrosilylation of the fluorenyl vinylbiphenyl monomer with polysiloxanes.  
 IT 225113-41-7P 225113-43-9P 225113-45-1P  
 225113-47-3P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (intermediates; in preparation of fluorenyl vinylbiphenyl monomers)  
 RN 225113-41-7 CAPLUS  
 CN Benzothiazole, 2-(7-bromo-9,9-diethyl-9H-fluoren-2-yl)- (9CI) (CA INDEX NAME)

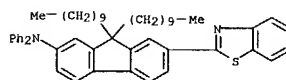


RN 225113-43-9 CAPLUS  
 CN Acetamide, N-[7-(2-benzothiazolyl)-9,9-diethyl-9H-fluoren-2-yl]-N-phenyl- (9CI) (CA INDEX NAME)

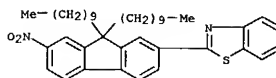


RN 225113-45-1 CAPLUS

L3 ANSWER 43 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)

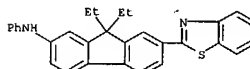


RN 262607-33-0 CAPLUS  
 CN Benzothiazole, 2-(9,9-didecyl-7-nitro-9H-fluoren-2-yl)- (9CI) (CA INDEX NAME)

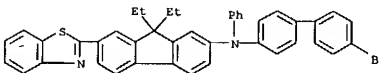


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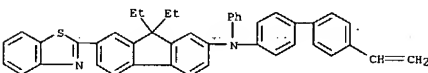
L3 ANSWER 44 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl-N-phenyl- (9CI) (CA INDEX NAME)



RN 225113-47-3 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-N-(4'-bromo[1,1'-biphenyl]-4-yl)-9,9-diethyl-N-phenyl- (9CI) (CA INDEX NAME)



IT 225113-48-4DP, reaction products with polysiloxanes  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (preparation and characterization of)  
 RN 225113-48-4 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-N-(4'-ethenyl[1,1'-biphenyl]-4-yl)-9,9-diethyl-N-phenyl- (9CI) (CA INDEX NAME)

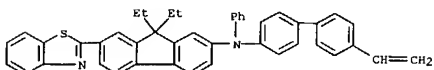


IT 225113-52-0P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation and characterization of)

RN 225113-52-0 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-N-(4'-ethenyl[1,1'-biphenyl]-4-yl)-9,9-diethyl-N-phenyl-, polymer with ethenylbenzene (9CI) (CA INDEX NAME)

CM 1

CRN 225113-48-4  
 CMF C44 H36 N2 S



09/11/2004

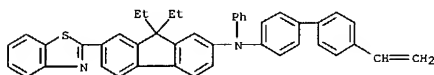
10784312

L3 ANSWER 44 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)

CM 2

CRN 100-42-5  
CMF C8 H8 $H_2C=CH-Ph$ 

IT 225113-48-4P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant of reagent)  
 (preparation and polymerization with styrene)  
 RN 225113-48-4 CAPLUS  
 CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-N-(4'-ethenyl[1,1'-biphenyl]-4-yl)-9,9-diethyl-N-phenyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE  
 FORMAT

L3 ANSWER 46 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:781324 CAPLUS

DOCUMENT NUMBER: 130:145737

TITLE: Probing two-photon excitation dynamics using

ultrafast

AUTHOR(S): Swiatkiewicz, J.; Prasad, P. N.; Reinhardt, B. A.  
 CORPORATE SOURCE: Photonics Research Laboratory, Departments of  
 Chemistry and Physics, State University of New York,  
 Buffalo, NY, 14260-3000, USA

SOURCE: Optics Communications (1998), 157(1-6), 135-138

CODEN: OPCOB8; ISSN: 0030-4018

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The authors probe the two-photon excitation dynamics of two new dyes,  
 N,N-diphenyl-7-(2-(4-pyridinyl)ethenyl)-9,9-di-n-decyl-fluoren-2-amine  
 (AF50) and (7-(7-benzothiazol-2-yl)-9,9-diethylfluoren-2-yl)-  
 9,9-diethylfluoren-2-yl)diphenylamine (AF250) using femtosecond  
 excitation

pulses by Z-scan and time-resolved pump-probe absorption measurements.  
 Irradiance dependence of the induced absorption cross-section is linked

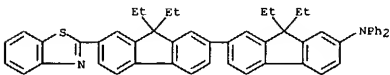
to linear absorption of the two-photon excited state. The excited state  
 linear absorption cross-section are  $1.0 \times 10^{-17}$  cm<sup>2</sup> for AF250 and  
 $2.7 \times 10^{-17}$  cm<sup>2</sup> for AF50. Relaxation of the two-photon excited  
 state follows a complicated path with three distinct relaxation times.  
 The longest ones, 1.6 ns for the AF50 and 1.9 ns for the AF250, are  
 associated with the resp. lowest singlet life-times: 2.23 ns and 2.15 ns.

IT 219998-27-3

RL: PRP (Properties)

(probing two-photon excitation dynamics using ultrafast laser pulses)

RN 219998-27-3 CAPLUS

CN [2,2'-Bi-9H-fluoren]-7-amine, 7'-(2-benzothiazolyl)-9,9,9',9'-tetraethyl-  
 N,N-diphenyl- (9CI) (CA INDEX NAME)

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE

FORMAT

L3 ANSWER 45 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1999:133764 CAPLUS

DOCUMENT NUMBER: 130:289152

TITLE: High-density three-dimensional optical data storage

in

A stacked compact disk format with two-photon writing  
 and single photon readout  
 AUTHOR(S): Pudavar, Haridas E.; Joshi, Mukesh P.; Prasad, Paras  
 N.; Reinhardt, Bruce A.

CORPORATE SOURCE: Photonics Research Laboratory, Department of  
 Chemistry and Physics, State University of New York at Buffalo,  
 NY, 14260, USA

SOURCE: Applied Physics Letters (1999), 74(9), 1338-1340

CODEN: APPLAB; ISSN: 0003-6951

PUBLISHER: American Institute of Physics

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Using a polymer block doped with a highly efficient two-photon dye, the  
 authors achieved a high d. data storage with gray-scale control in  
 multiple planes as stacked compact disks at a separation of 10 μm. The  
 absorption and fluorescence of the dye at the written spot shift to a  
 longer wavelength, permitting an easy fluorescence mode readout with a  
 linear excitation using an inexpensive laser source. The storage

capacity in this case is estimated to be 1012 bits/cm<sup>3</sup>.

IT 222617-85-8, AF 240

RL: MOA (Modifier or additive use); PEP (Physical, engineering or

chemical process); PROC (Process); USES (Uses)

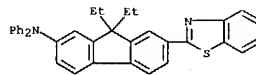
(AF 240; high-d. three-dimensional optical data storage in stacked

compact disk format with two-photon writing and single photon readout)

RN 222617-85-8 CAPLUS

CN 9H-Fluoren-2-amine, 7-(2-benzothiazolyl)-9,9-diethyl-N,N-diphenyl- (9CI)

(CA INDEX NAME)



REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE

FORMAT

L3 ANSWER 47 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1993:549604 CAPLUS

DOCUMENT NUMBER: 119:149604

TITLE: Preparation of pyrimidinylbenzothiazole derivatives

as

liquid crystals and liquid crystal compositions  
 containing them for liquid crystal devices and

display

apparatus

Nakamura, Shinichi; Takiguchi, Takao; Iwaki, Takashi;

Tokano, Goji; Yamada, Yoko

Canon Kk, Japan

Jpn. Kokai Tokkyo Koho, 69 pp.

CODEN: JKXXAF

Patent

Japanese

DOCUMENT TYPE: Patent

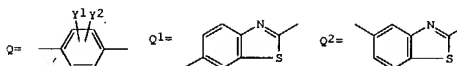
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 05125076	A2	19930521	JP 1991-289934	19911106
PRIORITY APPLN. INFO.:			JP 1991-289934	19911106

GI



AB R1A1B1A2R2 [I; R1, R2 = C1-18 linear or branched alkyl, wherein 1 or  
 2 non-adjacent CH2 groups may be replaced by 2 (wherein 2 = O, S),  
 ZC(O), C(O)2, CO, OCO2, CONR3 (wherein R3 = H, C1-5 alkyl), NR3CO, CH:CH,  
 or C.tplbond.C; A1 = 2,5- or 5,2-pyrimidinediyl; A2 = single bond, Q  
 (wherein Y1, Y2 = H, halo, cyano, CF3), 1,4-cyclohexylene, 2,5- or  
 5,2-pyrimidinediyl, -pyridinediyl, or -thiazolediyl, 2,5-thiophenediyl,  
 1,3,4-thiadiazole-2,5-diyl, 2,6-naphthylene, 2,7-fluorenylene,  
 9,10-dihydro-2,7-phenanthrenylene; B1 = Q1, Q2] are prepared A liquid  
 crystal

composition, preferably a chiral smectic liquid crystal composition,  
 contains I. I

provide ferroelec. chiral smectic liquid crystal compns. with good  
 switching

property, improved low temperature driving property, and reduced  
 temperature

dependence of response speed.

IT 149776-65-8

RL: USES (Uses)

(ferroelec. chiral smectic liquid crystal compns. containing, for

display

devices)

RN 149776-65-8 CAPLUS

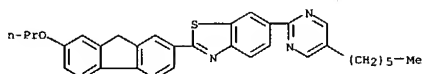
CN Benzothiazole, 6-(5-hexyl-2-pyrimidinyl)-2-(7-propoxy-9H-fluoren-2-yl)-

(9CI) (CA INDEX NAME)

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L3 ANSWER 47 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)



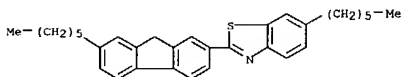
L3 ANSWER 48 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1992:162651 CAPLUS  
 DOCUMENT NUMBER: 116:162651  
 TITLE: Mesomorphic compounds for liquid crystal compositions for display devices  
 INVENTOR(S): Iwaki, Takashi; Takiguchi; Togano, Takeshi; Yamada, Yoko; Nakamura, Shinichi  
 PATENT ASSIGNEE(S): Canon K. K., Japan  
 SOURCE: Eur. Pat. Appl., 212 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 440061	A1	19910807	EP 1991-100694	19910121
EP 440061	B1	19980401		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE				
JP 03227980	A2	19911008	JP 1990-19725	19900130
JP 2974352	B2	19991110		
JP 04029984	A2	19920131	JP 1990-332694	19901129
JP 3029124	B2	20000404		
CA 2034309	AA	19910723	CA 1991-2034309	19910116
CA 2034309	C	19970401		
EP 667385	A1	19950816	EP 1995-101836	19910121
EP 667385	B1	19990804		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE				
AT 164577	E	19980415	AT 1991-100694	19910121
AT 192920	E	19990815	AT 1995-101836	19910121
US 5236619	A	19930817	US 1991-643377	19910122
US 5284599	A	19940208	US 1992-915888	19920720
PRIORITY APPLN. INFO.:			JP 1990-12065	A 19900122
			JP 1990-19725	A 19900130
			JP 1990-332694	A 19901129
			EP 1991-100694	A3 19910121
			US 1991-643377	A3 19910122

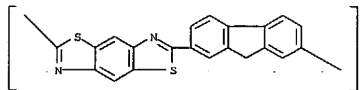
OTHER SOURCE(S): MARPAT 116:162651  
 AB The mesomorphic compds. have the general formula R1A1B1A2R2, where R1, R2 = C3-18 alkyl in which 1 or  $\geq 2$  nonadjacent CH2 groups may be replaced by Z, ZCO, COZ, CD, OCOO, CON(R3), N(R3)CO, CH:CH, or C:tpbond; Z = O or S; R3 = H or C1-5 alkyl; B1 = benzothiazole-S,2-diyl or -6,2-diyl; A1 = single bond, 1,4-phenylene (possibly mono- or disubstituted with F, Cl, Br, Me, CN, and/or CF3), or 1,4-cyclohexylene; A2 = single bond, A3, or A3A4; and A3, A4 = A1, 2,6-naphthylene, 5,2- or 2,5-pyridinyne, 5,2- or 2,5-pyrimidinylene, thiophen-2,5-ylene, fluorene-2,7-diyl, or 9,10-dihydrophenanthren-2,7-diyl.  
 IT 139716-35-1P  
 RL: PREP (Preparation)  
 (preparation of, for liquid crystal compns. for display devices)

L3 ANSWER 48 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN (Continued)  
 RN 139716-35-1 CAPLUS  
 CN Benzothiazole, 6-hexyl-2-(7-hexyl-9H-fluorene-2-yl)- (9CI) (CA INDEX NAME)



L3 ANSWER 49 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1989:534846 CAPLUS  
 DOCUMENT NUMBER: 111:134846  
 TITLE: Rigid-rod benzobisthiazole polymers with reactive fluorene moieties: I. Synthesis and preliminary characterization  
 AUTHOR(S): Dotrong, My; Evers, Robert C.  
 CORPORATE SOURCE: Res. Inst., Univ. Dayton, Dayton, OH, 45469, USA  
 SOURCE: Polymeric Materials Science and Engineering (1989), 60, 507-11  
 CODEN: PMSEGD; ISSN: 0743-0515  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Benzobisthiazole polymers capable of thermal crosslinking were prepared by polymerization of 2,7-dicyanofluorene or 2,7-fluorenedicarboxylic acid with 2,5-diaminobenzene dithiol dihydrochloride and terephthalic acid or terephthalic acid chloride. The polymers were soluble only in methanesulfonic acid or polyphosphoric acid, and had thermooxidative stabilities higher than those of conventional benzobisthiazole polymers. Gelling of the polymers occurred at temps.  $>165^\circ$ .  
 IT 122727-25-7P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation and characterization of)  
 RN 122727-25-7 CAPLUS  
 CN Poly(benzo[1,2-d:4,5-d']bisthiazole-2,6-diyl-9H-fluorene-2,7-diyl) (9CI) (CA INDEX NAME)



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TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

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390.69

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE

TOTAL

ENTRY

SESSION

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